

Rupturing Urban Sound(scape)s

**Spatial Sound Design
for the Diversification of
Affective Sonic Ecologies**

**A thesis submitted in fulfillment
of the requirements for the degree of
Doctor of Philosophy**

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August 2014

Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

Jordan Lacey 16th August 2014

Acknowledgements

First and foremost, I wish to thank my supervisors, Associate Professor Lawrence Harvey and Doctor Charles Anderson.

Lawrence Harvey, my primary supervisor, has provided invaluable support from the beginning to the end of the PhD process. From the moment I approached him and expressed my interest in undertaking a PhD at SIAL Sound Studios he has fully supported my various applications, submissions, projects, papers and teaching. I have enjoyed the many hours we spent discussing ideas, during which he conveyed moments of illumination that became integral to the unfolding of the PhD process.

Charles Anderson has patiently guided me through the steep learning curve of applying design research thinking to a creative arts practice, for which I am grateful. He has taught me the art of diagramming as a making tool, which greatly enhanced my reflective practice, and became crucial in discovering knowledge for the PhD. I gratefully acknowledge his calming voice during troubling moments.

I also wish to thank Peter Downton who shared many a coffee with me in the first year of my PhD, taking the time to thoughtfully answer my question: “So Peter, what is this thing called design research?”

Thank you to Philip Samartzis for his interest in my work and offering me wonderful opportunities that formed the later part of my PhD project work, particularly my involvement in the 14th Liquid Architecture Sound Art Festival and the NGV Melbourne Now exhibition.

To the many colleagues in the School of Architecture and Design for their stimulating conversations and thoughtful feedback. Particularly Hélène Frichot, Ross McLeod, Suzie Attiwell and Tania Splawa-Neyman.

Thank you to my colleagues at SIAL Sound Studios for their support and time. Particularly Jeffrey Hannam whose skills as a Max/MSP programmer was integral to some of the project work, and also to my learned fellow PhD travellers Dan St Clair, Jim Barbour and Peter Holmes who shared of their knowledge so generously.

My thanks to Jianne Whelton for copyediting the work within a very short timeframe. And to Donna Sceney for contributing to the design of the ADR.

To Rebecca Pohlner, for her boundless patience and generosity. Clearly, I could not have achieved this without her support. And to Javan and Eva, who encouraged me to the end with their weekly question, “Dad, have you finished the PhD yet?” Also a thank you to Peter Lacey, and Peter and Pauline Pohlner for their help during times of need.

Dedicated to my mother.

Abstract

In this PhD urban sounds are treated as an affective sociopolitical medium, which can be designed to reengage urban listeners. The project work and conceptual tools discussed in the PhD evolved through a recursive process that engages with city sounds through listening, sound installations, interventions and performances, which diversify the homogenised everyday atmospheres of urban sound(scape)s. Urban soundscape design is of increasing practical and theoretical interest at the international level. Questions as to the acoustic conditions that societies expect from public urban sound environments has entered the lexicon of multiple disciplines, which has produced a wide range of positions on the topic. Discussion of urban soundscape design is often synonymous with the removal of noisy environments, which are deemed to produce unhealthy effects. However, there are an increasing number of voices that call for new understandings of urban sounds that treat noises as complex events, which afford creative engagement. Concurrent with these differing approaches to urban soundscape design are evolving notions of the theoretical meaning of sound, away from the static, analysable 'object', towards the dynamic, unfolding 'event'. Consequently, the sonic concepts of *soundscape* and *sound object* are being replaced with new terms such as *audible ecosystems*, *sound-as-flux*, *sonic ecologies* and *affective acoustic atmospheres*. This PhD offers its own new term to understand relationships between sounds and listeners: *affective sonic ecologies*. Where the effects of a sonic ecology are homogenous, a diversely affective ecology is designed through the production of ruptures. Ruptures, which are produced by a *process-of-musicality*, are listening points in urban spaces that afford diverse human experiences through the repatterning of urban sound(scape)s. Affective sonic ecologies that are homogenised by *The Striated Sound(scape)* are considered mythopoetically as the singular expression of a city's *Voice*. The *Voice* of the city is diversified through a range of sound(scape) design approaches that have been discovered in the course of the PhD work, including Subtraction, Addition, Passion and Transformation. A reflective process, in which the totality of the PhD design research has been considered, led to the emergence of an ecological model for urban sound(scape) design that is presented as a contribution to knowledge for the domains of urban soundscape design, site-specific sound-art and sonic theory.

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Introduction:

A Design Research Practice

The design research PhD program in RMIT's School of Architecture and Design enables the creative practitioner to discover knowledge through practice, while simultaneously becoming aware of the permutations of this practice. Prior to and during this PhD research process, I have had many conversations with creative practitioners who, when asked to describe their working process, reply with something along the lines of, "I don't know, I just do it". A design research PhD unpacks this "doing it": questions about process are investigated thoroughly and meaningfully, enabling the creative practitioner to articulate a creative process that, perhaps, was previously only instinctually realised. The scope of my personal sonic practice has evolved as a consequence of the PhD research process: whereas I began the PhD primarily as a musician and creative sound practitioner, I have neared the end of the PhD as an installation artist, sound-artist and musician who practices *musicality-as-rupture* (to be discussed at length towards the end of the ADR) in urban sound(scape)s.

I found the opportunity to apply a design research process to my practice, for the express purpose of discovering new knowledge within the domain of urban soundscape design, particularly fascinating. This process is in keeping with comments by Peter Downton, the foundation Head of RMIT's School of Architecture and Design from 1997-2001, who writes "design is a way of inquiring, a way of *producing knowing* and knowledge; this means it is a *way of researching*" (Downton, 2003, p.1, my emphasis).

I entered the PhD with training as a musician, teacher and environmentalist. My positioning in the school of architecture and design has allowed

me to reorientate my training and practice within a design paradigm. The result has been the forging of a research career that transverses the domains of urban design, landscape architecture, urban soundscape design and site-specific sound-art. My research contributes to an increasing awareness, across these disciplines, of the capacity of auditory spatial awareness and sound design to strengthen interconnections between urban space and its inhabitants.

My research efforts have benefited from the guidance provided by both of my supervisors, each representative of the multidisciplinary approaches to research adopted by academics and creative practitioners within the school. My first supervisor, Lawrence Harveyⁱ, is a composer and sound designer who established and directs SIAL Sound Studios, an electroacoustic studio embedded within the School of Architecture and Design pursuing research in Spatial Sound Composition and Design, Acoustic Design and Urban Soundscape Research. SIAL Sound studios have enabled the proliferation of unique research approaches including my own PhD, which grew from the urban soundscape research approaches developed at SIAL. Similarly, my second supervisor, Charles Andersonⁱⁱ, an established visual artist who is the Senior Lecturer and Program Manager of the Masters of Landscape Architecture, works across multiple domains in art and design. Charles Anderson's guidance, and my understandings of his own practice, made me aware of the capacity of an arts practice to become applicable, and valuable, across multiple domains. Figure 1 on page 10 lists my teaching and publication achievements during the PhD, which indicate the relevance of my research to multiple disciplines. I have taught studios, seminars and specialisations

i For a discussion of Harvey's creative works and PhD research see Harvey (2008).

ii For a discussion of Anderson's creative works and PhD research see Anderson (2009).

across landscape architecture, interior design, fashion and sound studies. I have also published in journals, books and conferences during the PhD that deal with disciplines as diverse as landscape architecture, urban sound design, environmentalism, cartography, soundscape studies and architecture.

My PhD work has been contained within a recursive process that has unfolded with its own internal logic for the pursuit of knowledge that makes a contribution to the domain of soundscape design.ⁱⁱⁱ By ‘contained’ I mean that the PhD operates within a specific recursive process. Although other expressions of my practice have emerged alongside the completion of the PhD, including performances and installations, I do not discuss these in relation to the specific recursive process explored here. The recursive process undertaken is a particular unfolding that has revealed knowledge integral to the discussed projects. The contribution to knowledge produced through the design research was revealed during an intensive reflective process; the production of this ADR, or exegesis, marks the final stages of this reflective process. However, it is important to note that reflection occurs throughout the entire recursive process – it is the engine, so to speak, that enables the process to continue working towards the moment of discovery. Each project, and its corresponding thinking and making processes, produces the conditions for the emergence of the next iteration, which propels the research into its continuing unfoldings. The unfolding itself presents an internal logic that cannot be articulated until it has been lived, made and realised through the project work. This internal logic is not preconceived and subsequently tested in the manner of a traditional PhD hypothesis-methodology-experimentation-results formula. The scope and pattern of the logic are only revealed upon the completion of projects. In fact, this internal logic is the *discovery* of practice; it enables the practitioner to proceed with works, post-research, equipped with a comprehensive knowledge of the tools and potential afforded by the practice. The internal logic of my design research process, as will be made clear by the ADR, was driven by my own evolving relationship with urban sounds; a seeking of diversity within what I came to perceive as homogenous sonic ecologies.

ⁱⁱⁱ Although my research transverses multiple domains, I would consider soundscape design to be the primary domain in which my practice is located.

‘Soundscape’, as a term, perseveres in sound-based domains, as it contains a certain sensibility that suggests a conversation – more or less – about the sounds that surround us. And yet, intellectually speaking, it has become a redundant term, as will be discussed at length in Chapter 1. The ADR often uses the term sound(scape) rather than soundscape. I have chosen to retain “scape” when referring to my work, as it connects my practice with a broader community of practice that persists in employing the term, albeit, in certain cases, somewhat negatively. I use parentheses to imply that the conversation is about human experiences in relation to fluxes of sounds, rather than a holistic “scape” of external sound to be judged and analysed. As will be discussed at length in Chapter 1 multiple theorists and practitioners have dismissed the term soundscape as a false characterisation of sounds, which are regarded as an external object of analysis. Increasingly, sounds are being thought of as milieus of unfolding and dynamic events that produce affective experiences within listeners. Alternative terms including ‘sound effect’, ‘sound affect’, ‘sound event’, ‘ecology of vibrational affects’, ‘audible ecosystems’, ‘acoustic (or sonic) atmospheres’, and ‘sound-as-flux’ are all in the mix. I will even add my own term later in the ADR: ‘affective sonic ecologies’. As a consequence, I use the term sound(scape) when referring to my personal projects, conceptual tools and theoretical positions in future sections of this ADR; I shall maintain the more familiar spelling ‘soundscape’ when referring to the ideas or publications of practitioners and organisations where this spelling is used. The clumsy appearance of sound(scape), I think, is a suitable representation of the state of sonic studies – so many interesting ideas and approaches, which have yet to settle under a collectively agreed term.

A further reason for maintaining “scape” is that it connects with the mythopoetic speculations of the Acoustic Ecology movement, particularly through the work of Murray Schafer.^{iv} This is something I wish to preserve in my own sound(scape) designs; therefore, the term sound(scape) also refers to the notion that urban sounds are the expression of a mythopoetic *Voice*. This *Voice*, as I will explain at length in chapter 3, first emerged as an imaginative response to the ubiquity of what is termed *The Striated Sound(scape)*. The concept of *The*

^{iv} For example, chapter 1 of Schafer’s seminal work *The Soundscape: Our Sonic Environment and the Tuning of the World* (1977) discusses the relation of sound to creation and apocalypse stories, and expands on mythopoetic vignettes such as “the voice in the wind” (p.15-28).

Striated Sound(scape), is a Deleuzo-Guattarian treatment of the typical pattern of broadband hums as represented in spectrograms. These broadband patterns, which are the everyday drones and hums of the city, are reimagined as the expression of the city's *Voice*. The concept of the city expressing a singular, homogenising *Voice* propels much of the work, both conceptually and creatively. This mythopoetic understanding informs relationships between sound practitioner and city, which is termed the *process-of-musicality*. The multiple approaches to sound(scape) design in the PhD have, in variant ways, interpreted urban sounds as the *Voice* of a city Leviathan with which city inhabitants (who both create and are subjugated by the *Voice*) must contend. The *Voice* is considered to produce both a homogenising and banalising effect, in interaction with which the affected listener responds by withdrawing from everyday life. In this sense, an important objective of the sound(scape) design approaches are to *diversify the city's sonic affects* on its human inhabitants, by producing alternative vocalisations of the city with public sound installations.

The present PhD work includes four major projects, each of which emerged through a recursive process; in sequential order they are *Silencing Urban Exhalations*, *Revoicing the Striated Sound(scape)*, *Intimate Footsteps* and *Subterranean Voices*. The four major projects are bookended by two minor projects, both essential to the unfolding narrative of the project work: the opening project is titled *Discovering Urban Noise*, and the closing project is titled *Noise Meditations*. Further to this ensemble of projects has been the discovery of four conceptual tools, which are theoretical positions on sociopolitical processes that produce contemporary urban sound(scape)s. These theoretical positions emerged while I was engaged in the making process, through a simultaneous reading of Gilles Deleuze, Felix Guattari and Henri Lefebvre, and their influence will be evident throughout the ADR. The theoretical tools present unique conceptions of the urban sound(scape), which can be used as applications to a sound(scape) design practice.

The first chapter of the ADR, *Beginnings*, includes an overview of communities of practice relevant to the PhD, along with other precursory notes and documents relevant to understanding the

ADR. *Subtraction, Addition, Passion* (labelled *Bifurcation* for reasons which will become clear) and *Transformation* – make up chapters 2 – 5 of the ADR. These four headings emerged directly from the making process, wherein different approaches to the production of public sound installations were discovered, including subtracting sounds, adding sounds, discovering passion and transforming sounds. During a post-project reflective period, these various manifestations of the recursive process became known as 'ruptures' within the urban sound(scape). The production of ruptures through a process-of-musicality, which is the focus of the ecological model for urban sound(scape) design, is the subject of chapter 6, *Rupture*. Chapter 7, *Contributions to Knowledge*, describes final discoveries, themes traced across the PhD, and discussions of practice, which contribute to the domains of urban soundscape design, site-specific sound-art and sonic theory. The final chapter, *Dreaming*, provides the context in which the PhD work will inform post-PhD practice.

Producing the ADR is an opportunity to revisit and re-experience the works produced for the PhD, and to configure a narrative from its perceived arrangement. The ADR process is integral to discovering contributions to the wider body of knowledge in the domain(s) within which the practice operates. And, hopefully, these realisations may contribute to the work of other practitioners within the identified domains.

1 Beginnings

1.1 Domain and Community of Practice

The present research is located within the domain of urban soundscape design. This domain crosses multiple disciplinary boundaries, including sonic theory, soundscape design and site-specific sound art. I will provide an overview of these disciplines in relation to my work, while positioning my work within a community of practice.

Sonic Theory

Sound, in my view, is neither mental nor material, but a phenomenon of experience – that is, of our immersion in, and commingling with, the world in which we find ourselves... sound, I would argue, is not the object but the medium of our perception
(Ingold, 2011, p.137-8)

Soundscape is a term popularised by the World Soundscape Project (WSP), and its successor, the World Forum for Acoustic Ecology (WFAE). Barry Truax defines a soundscape as:

“An environment of sound (or sonic environment) with emphasis on the way it is perceived and understood by the individual, or by a society. It thus depends on the **relationship** between the individual and any such environment[...] The study of the systematic relationships between humans and sonic environments is called soundscape ecology, whereas the **creation**, improvement or modelling of any such environment is a matter of soundscape design (Truax, 1999 my emphasis)¹.

Many leaders in contemporary sound studies, including Agostino DiScipio, Bjorn Hellström, Brandon LaBelle, Christopher Cox and Steve Goodman, are critical of acoustic ecology as being judgemental of the urban, and steeped in romantic, even quasi-religious sentiments. I begin the conversation with this quote from Barry Truax to make clear from the start that the barrage of criticism directed at Acoustic Ecology and the term soundscape (*de rigueur* in contemporary sound studies) is not entirely justified. As will become clear in the ADR, I actually join this wave of criticism, however, I want to be clear that soundscape as defined by the Acoustic Ecology movement is more flexible and open to interpretation than many of its critics would like to think.

Implicit in Truax's definition is a creative opportunity rarely attributed to the WSP, WFAE or Acoustic Ecology. For example, amongst the various definitions provided in the above quote by Truax, soundscape is described as a relationship, not an object, and soundscape design is characterised as creation, not as a noise removal tool. During 2012-14, I was President of the Australian Forum for Acoustic Ecology (AFAE). I found members of the movement, who were an eclectic mix of practitioners and intellectuals, bemused by this fracas. There were certainly

¹ See: <http://www.sfu.ca/sonic-studio/handbook//Soundscape.html> (accessed 07/07/2014).

some members who pined for a quieter world, but then again there were others who enjoyed creating live noise music. Perhaps acoustic ecology, in the contemporary sense, is a loose term under which those interested in sound choose to gather. Although anti-noise sentiments and a love of the “natural” still persist in the overall *zeitgeist* of the Acoustic Ecology movement, it is my view that its member base and intellectual activity should be considered pluralistic, relevant and evolving.

Criticisms of the term ‘soundscape’ are often encountered alongside criticisms of the term ‘sound object’. This has produced a complex and fascinating intellectual field, and a flux of nascent shifting opinions for the contemporary practitioner to enter. Jean-Francois Augoyard and Henry Torgue, editors of the CRESSON research team’s study entitled *Sound Experience: A Guide to Everyday Sounds*, question whether the term soundscape is “useful and pertinent” beyond “the fields of aesthetic analysis, creation, and conservation” (Augoyard and Torgue, 2005, p.7). Steve Goodman (2010), a contemporary Deleuzian sonic philosopher, finds in the term soundscape a “politics of silence (which) assumes a conservative guise and promotes itself as quasi-spiritual and nostalgic for a return to the natural” (p.191); that is, a belief in a perfect sound environment that is “out there”. In bringing attention to the hostility that acoustic ecology has for noise, Brandon LaBelle (2006) presents a similar critique: “that acoustic ecology may pass judgement on noise as negative is to fall short of recognizing it as part of the sound world, if not potentially its most expressive moment” (p. 214). Agostino DiScipio, composer and generator of audible ecosystems,² describes soundscape compositions as “a strategy of *separation* and *objectification* when playing-back, in adequately equipped concert rooms, sound recorded in places foreign to the particular room”, which is akin to a “sonic tourism” (DiScipio, 2014, p.12, my emphasis). Hellström states that acoustic ecology concepts “are [...] based upon more or less classical-romantic aesthetics (and that) one can discern a hostile attitude towards [...] urban life” (Hellström, 2003, p. 20).

The conversation becomes more complicated when comparative critiques are made alongside Pierre Schaeffer’s sound object, a phenomenology of sound, which was born in his analysis of the minimal sonic units of *musique concrète*. Augoyard and Torgue (1995) question the use of the sound object concept “for the description and analysis of urban sounds” (p.6) preferring their ‘sound effects’ for this task. Yet, CRESSON’s sound effect, which “bridges the dualities of concepts of the soundscape and sound object” (Goodman, 2010, p.xvii) is criticised by Goodman as not going far enough. He says it requires further “transform(ation) into the less anthropocentric environmentality or ecology of vibrational affects” (p.xvii). The sonic philosopher Christopher Cox, who advocates a Deleuzian sound-as-flux approach, states that “Schaeffer’s language of the ‘sonorous object’ misses the mark. For sounds are peculiarly temporal and durational, tied to the qualities they exhibit over time. If sounds are particulars or individuals, then they are so not as static objects but as temporal events” (Cox, 2014, para.11). Similarly, DiScipio (2014) challenges the term sound object suggesting that it “turns off the relational and contextual meaning inherent to a musical way of knowing. It prevents a becoming aware of sound as the fragile trace of agencies belonging to the actual place and time” (p.12). DiScipio argues instead for the ‘sound event’, which “attends to the audible

manifestation of relations and interactions in the space-time unity of experience, in the here-and-now... sensitive to the ecology of the living and embodied process that auditory perception is" (p.12).

Critiques of soundscape as a term have also emerged in non-sonic disciplines, such as anthropology, geography and social studies. The quote above by Tim Ingold, an anthropologist, is indicative of this interest in the term soundscape, which extends beyond sound studies. Similarly to the discussion above, Ingold is critical of the term soundscape, as it defines sound as an external object rather than the lived experience of the immediate. Similarly, sound, which plays an important role in the ecological discussions of philosopher and literary critic Timothy Morton, is described as experiential and as existing in the *now*. I have encountered similar criticisms amongst colleagues in the School of Architecture and Design, especially Landscape Architecture, who perceive of sounds as experiential phenomena that are an extension of the landscape. Colleagues in the School of Sound Art have been critical of acoustic ecology as not developing a complex enough relationship with urban sounds, or the *Sonic City*³. These criticisms resonate with interesting recent developments in conceptions of sound, particularly atmospherics and affects. As will be discussed in the ADR, theorists such as Gernot Böhme and Jean-Paul Thibaud discuss acoustic atmospheres and sonic ambiances as in-between spaces within which emotions and social relations are translated. It is interesting to note that these "affective" approaches resonate somewhat with Goodman's ecology of vibrational affects and Cox's sound-as-flux, all of which can be traced to a Deleuzian understanding of the immanency of affective experience, as will be discussed throughout the ADR. In all of these discussions sound loses its ideological and object status, instead becoming embedded in the everyday as affectual expressions.

Within this complex web of critiques, I take the position that sound has ceased to be an object of analysis, and has become something affective, lived and experienced; an expression of an ecology of the here and now. My work explores sound as an affective, atmospheric and sociopolitical medium, and thus, finds connections within this broad community of theorists who reposition sound as something immanent and ecological.

Soundscape Design

The majority of sonic environmental research today is concerned with protecting people from sounds. The opposite attitude promotes supportive and creative approaches to sounds. That is to say, by entering deeply into the very complexity of the sound world, we pursue knowledge that does not hide our relation to the sound world, but rather reveals its riches (Hellström, 2003, p.204).

Hellström's quote describes his interest in relating with the complexities of the sound world, including its noises. Hellström is the first soundscape design practitioner I discovered that takes an affirmative approach to noise. Interestingly, since the time of this quote, Hellström's approach has shifted somewhat, in accordance with the soundscape⁴ imperatives of the European Union and the World Health Organisation. For example, he recently stated that "In major European cities, noise levels are so high that the majority of urban parks can no longer truly serve as recreational environments, a problem the WHO and EU are attempting to address" (Hellström,

3 For a discussion of the Sonic City, see the curatorial essay written for the *Liquid Architecture 14th National Festival of Sound Art*. The festival was curated, amongst others, by Philip Samartzis, head of the RMIT School of Sound Art.

4 The EU and WHO use the term soundscape in their documentation. For example, see the following link for a discussion of the European Union funded European soundscape award: <http://www.eea.europa.eu/highlights/berlin-park-wins-award-for> (accessed 03/10/2014).

- 5 See: <http://www.resonantdesigns.com/> for more information (accessed 08/07/2014).
- 6 Unfortunately two of these systems have been decommissioned, with the remaining system at Federation's Square's North Atrium reduced to a CD playback system.
- 7 See a video excerpt from the conference here: <http://www.youtube.com/watch?v=fHbV9fSxYoA> (accessed 08/07/2014).

2012, p.1). Having visited two of Hellström's soundscape designs at Mariatorget (Hellström, 2012) and Gallerian Shopping Centre (Hellström, 2011) both in Stockholm, it is clear that Hellström has successfully combined his recent pursuit of soundscape design as a health issue, while retaining his interest in noise design. He uses a technique of informational masking, by applying sound-art techniques for the delivery of sounds via speaker arrays through which "new sound draws the listener's attention so that existing sounds become inaudible or weaker" (Hellström, 2011).

The city of Melbourne, where I reside, is home to a number of electroacoustic soundscape systems. Harvey et al. (2014) provide a detailed overview. Nigel Frayne, of *Resonant Designs*⁵, and former president of the World Forum for Acoustic Ecology, is responsible for the installation of two soundscape systems at Federation Square, and one soundscape system at Southbank⁶. A number of works were played on these systems, including Lawrence Harvey's work *Canopies*, which sought "to interpolate a series of electroacoustic environments into the Southgate precinct composed from the essences of the natural soundscape" and was "designed for a transitional space, a type of space where listeners are usually in motion" (Harvey, 2008, p.72). Although their approaches are different, both Hellström and Harvey have sought to create sounds that respond directly to the environment, by considering the environment as part of the creation and installation of introduced sounds. Furthermore, they have both used speaker arrays as a means of delivering sounds, with careful consideration of the balance of ideal listening conditions and integration into the space. Their approaches identify the primary difference between soundscape design and sound-art, as I consider it. Soundscape designs *emerge* within the space where the work is to be installed, it is therefore implicitly site-specific, where as sound-art *translates* an idea onto a space, which is not necessarily relational with the existing sonic conditions of the space in which it is realised.

Agostino DiScipio's audible ecosystems can be considered a mixture of soundscape design, sound-art and composition, insofar as they generate sonic space through the use of feedback mechanisms, in particular microphones, that pick up sounds from the immediate environment that are fed back into the environment via a computer system, creating an interconnected web of relations between performer, listener and environment. See for example DiScipio's piece *Modes of Interference 2*⁷, which was presented at the 2014 Music and Ecologies conference at University of Paris 8, in which a musician plays both an instrument and the space in which the performance is situated. Urban soundscape design was provided its own manual by the CRESSON research team, under the leadership of Jean-Paul Augoyard and Henri Torgue, who produced a lexicon of sound effects in their book *Sonic Experience: A Guide to Everyday Sounds*. Sound effects emerge at the intersection of the built environment, human perception and cultural context, and provide a detailed structural and phenomenological tool for realisations of soundscape designs. Hellström's work has been strongly influenced by CRESSON, particularly in his application of the Metabolic effect (Hellström, 2003, p.81). Acoustic Ecology's contribution to urban soundscape design is defined by anti-noise sentiments as reflected in their identification of *hi-fi* and *lo-fi* soundscapes. As explained by Truax,

'[S]ituations where signal detection is difficult or impossible may be termed "lo-fi" environments, by analogy to electroacoustic signals of poor quality, high noise, and distortion. The complementary situation, the "hi-fi" environment, is one in which all sounds may be heard clearly, with whatever detail and spatial orientation they may have. Such an environment is, by definition, balanced and well "designed" (Truax, 2001, p.23)

8 See <http://www.wellcomecollection.org/whats-on/exhibitions/white-sound.aspx> for more information (accessed 09/07/2014).

Implicit in Truax's quote is the much-discussed antipathy towards noise that pervades the Acoustic Ecology movement. This is a theme that will be visited often throughout the ADR.

Site-Specific Sound Art

Sound installation positions a listener inside a complex space defined by a general relation of the found and the constructed (LaBelle, 2006, p.151)

As suggested by LaBelle's comment, all sound installations are a mix of the found and constructed. This may seem to contradict my above definition of the differences between soundscape design and sound-art, in which I characterise soundscape design as *emerging* within existing sonic conditions of space, and sound-art as being *translated* upon a space; however, in both situations a mix between "found and constructed" exists. In a soundscape design the constructed is formed from the found, whereas in a sound-art work a relationship between the found and constructed is not necessarily required. Two of the earliest influences on urban soundscape design and site-specific sound-art, in my reckoning, are Luigi Russolo and John Cage. Luigi Russolo, a futurist composer from the 1910s built *intonarumori*, large-scale instruments that reproduced the noises of the industrial city. In effect, these were designed instruments that could reproduce everyday urban sounds in a concert setting, and were perhaps an initiating step in perceiving urban sounds as a type of music. The prolific and influential composer John Cage is probably best known for his work 4' 33". Of its many realisations, one involves John Cage sitting in silence at a piano in an open public space, which acts as encouragement for the listening audience to focus on surrounding sounds. In so doing Cage presents the sounds of the world as music to be listened to.

LaBelle discusses at length the work of Max Neuhaus in his book *Background Noise: Perspective on Sound Art*. Max Neuhaus was originally a percussionist whose musical interests moved from the concert hall into the public realm. Neuhaus' work engages soundscape design and sound-art simultaneously, particularly his 1970s work *Times Square* (now permanently installed), in which a large speaker located beneath a grill emits "a deep resonating drone, like a ventilation hum or some mysterious mechanical object" (LaBelle, 2006, p.157). The sounds emanating from the speaker mix with the sounds of Times Square, producing altered listening conditions that maintain a sonic familiarity. Bill Fontana is most well known for his dislocation of geographies in which he electroacoustically feeds one sound environment into another; for example *Sound Island*, in which he "technologically relayed sounds found at locations along the Normandy coast to forty-eight speakers mounted across the façade of the Arc de Triomphe in the centre of Paris" (LaBelle, 2006, p.231). Another work, *White Sound: An Urban Seascape*, which was commissioned by the Wellcome Collection in 2011, feeds the sounds of a Dorset shoreline, into a busy Central London road via a speaker array⁸. His work lends a unique meaning to *site-specific*, in which two geographically distant sites unite to form

9 For more information see: http://www.massmoca.org/event_details.php?id=150 (accessed 07/07/2014).

a combined sonic affect. Bruce Odland and Sam Auinger's *Harmonic Bridge*, presented at Mass MoCA in the USA, is yet another work that touches on soundscape design and sound-art: located beneath a bridge, precision-cut lengths of pipe shapes the drone of traffic into the key of C⁹. The work is now a permanent fixture and is an example of non-electroacoustic means to transform the urban soundscape. Its success is potentially attributable to the selection of a familiar, and thus more easily consumed, harmonic system, though one wonders what effects could have been produced if, say, the alternative drone systems of La-Monte Young were explored, such as he achieved for his 1960's creation *Dream House*, an immersive sonic experience in which architecture is sonically tuned for the production of affective experiences (LaBelle, 2006, p.73).

David Chesworth and Sonia Leber are well-known Melbourne collaborators who create multi-speaker works in public spaces around the world. They are responsible for many sound works, most notably *Proximates*, which is a permanently installed sound work at William Barak Bridge, Melbourne, commissioned by the 2006 Commonwealth Games. The installation includes a large number of people from commonwealth countries singing in their own languages. In 2013, their Federation Square installation *We, The Masters* included the sound of multiple dog owners calling to their pets. Another work, *5000 calls*, commissioned by the Sydney Olympic Games and installed in the forecourt of Stadium Australia, played the recorded vocalisations of 5000 people exerting themselves in everyday life. Common to the discussed works of Chesworth and Leber is a concentration on the sounds of human voice, which in my opinion produces a type of "humanising" of the urban spaces in which the works are realised. Robin Fox is another notable Australian sound-artist, best known for his laser works, who also creates public sound installations. A recent work installed in Melbourne, *Giant Theremin*, was a giant instrument that could be controlled by the movement of passing crowds, producing a combination of interesting sounds and playful human gestures. I consider the work of Chesworth and Leber, and that of Fox to be firmly located within the domain of sound-art rather than soundscape design, as their works translate an idea onto a space that is not dependent on the existing sonic conditions of space; there is no reason that these works, which focus on the human voice or the use of giant instruments, could not be located within multiple spaces across a city.

Two Australian sound artists who produce site-specific sound-art that crosses into the soundscape design domain (according to my definition) are Nigel Helyer and Ros Bandt. Of particular interest is Helyer's work *Din: Ding-Dang-Dong*, created for Seoul Olympic Park in South Korea. It includes a series of giant, apparently soundless bells that are activated by site-specific conditions, including wind and visitors who strike the structures. Helyer's website (sonicobjects.com) includes numerous designs for installations that respond to wind, water and other site-specific conditions. Bandt, whose instructive book *Sound Sculpture: Intersections in sound and sculpture in Australian artworks* provides a comprehensive analysis of pre-2001 Australian sound artworks, is a prodigious producer of sound installations and performances. Bandt's numerous works that depend on site-specific conditions include her Aeolian Harps and her performances that play with the reverberant qualities of the insides of water tanks.

An influential international sound-artist that works with urban sounds is Cristina Kubisch. Her work *Oasis 2000: Music for a Concrete Jungle* at the Hayward Gallery (as part of the *Sonic Boom* exhibition in 2000) enabled listeners to walk outside with headphones and hear multiple animal and nature sounds while simultaneously looking out over South London. Her headphone work continues to evolve with her recent *Electrical Sound Walks*, in which modified headphones allow the urban listener to hear typically inaudible electromagnetic frequencies. Akio Suzuki is a Japanese sound-artist whose work *Oto Date* invites listeners to stand on footprints painted intentionally by the artist whose placement provides urban dwellers with interesting listening experiences. His minimalist approach combines soundscape design and sound-art approaches, by asking city-dwellers to listen intently to the existing sounds of the city. Both Kubisch's and Suzuki's works can be related to the act of soundwalking, which is an ongoing practice within the WFAE. For example, Anthony Magen from the Australian Forum for Acoustic Ecology (AFAE) has a long established soundwalking practice; he participates in popular events, such as the *Melbourne Jazz Festival*, encouraging attendees to develop listening relationships with their city. Another work by Magen, *Endangered Sounds: An Acoustic History of Brunswick*, which grew from his soundwalking and urban design practice, engages with issues of gentrification by recording factory machinery, and the voices of the operators of the machinery, just before the space is redeveloped and the machinery is decommissioned. The recordings can be geospatially located and listened to in situ through smartphone technology, after the sites' residential development. Magen's work, in my opinion, is an example of the pluralistic approaches that continue to evolve within the Acoustic Ecology movement.

Finally, Susan Philipsz, winner of the 2010 Turner Prize, took a unique approach to urban soundscape design and site-specific sound art by installing the sound of her voice singing Scottish ballads in empty alleyways and beneath urban bridges. There is a mythic quality to her work, in which a sense of the ancient, or of a haunting, pervades the atmosphere. This mythic quality is particularly interesting to me; I imagine that her work actualises ancient traces latent within constructed urban spaces. I would position Philipsz's work, as well as many of the other practitioners mentioned in this section, as the *revoicing* of existing urban soundscapes. As will be discussed this is a theme which forms a central part of my own sound(scape) design practice. Furthermore, the work of the discussed sound artists', except where specified, overlaps with soundscape design approaches, as the existing conditions of space are integral to the creation and installation of the works. Similarly, I see my own practice as co-existing across the domains of site-specific sound-art and soundscape design.

1.2 Two Important Notes for Understanding the ADR

Note 1: An explanation of differing voices utilised for the conceptual tools

While completing this PhD, I have come to understand that sound(scape)s are representative of socio-political controls that shape the everyday experiences of urban dwellers. A key aspect of the

10 The content and language of the conceptual tools evolved during review processes in submissions to *Deleuze Studies* and *Sound Effects: an interdisciplinary journal of Sound and Sound Experience*, the latter of which published a paper based on two of the conceptual tools under the title "Conceptual Overlays for Urban Soundscape Design Emerging from a Transversal Analysis of Lefebvre, Deleuze and Guattari, and Arendt".

practice discussed is to discover these spatiotemporal controls, and unravel their dominating affect on urban spaces through the design of sound(scape) installations. Concurrent with the design of six projects (see Table 1, page 11), four conceptual tools (see Table 2, page 13) have been produced as part of the PhD. The conceptual tools are presented below, as four distinct (though interrelated) theoretical positions that provide the sound(scape) designer with spatial and temporal frameworks with which to understand, analyse and design urban sound(scape)s. While creating the six projects, I was reading texts by Henri Lefebvre, Gilles Deleuze and Felix Guattari, particularly certain expositions on space, time and nature. Transversal themes from the readings coalesced in my mind, providing me with a language to articulate the experiences I was having while engaged in the act of formulating and implementing the six projects. The language describing these four conceptual tools has developed through multiple written iterations¹⁰. Two of the tools, *Radiating Striations of Centralities* and *The Isorhythmic Refrain*, have been written with a dense and complex voice that reflects Deleuze and Guattari's, as well as Lefebvre's writing styles, for two reasons. Firstly, as I am constructing new ways of perceiving the urban sound(scape) based on these philosophers' writings, I wanted to engage with their language as much as possible, so that a consistency exists between my tools and the texts that the tools reference. Secondly, in reading texts written in this manner, the mind may be presented with images that in themselves can be catalysts for creative inspiration in the formulation of works, both as ideas and as physical realisations. It is my hope that these two conceptual tools will be as effective and affective in their capacity to catalyse creative responses in my readers. In keeping with the density of the language referenced by *Radiating Striations of Centralities* and *The Isorhythmic Refrain*, and also under the later chapters, *Rupture* and *Contributions*, the text includes a number of terms specific to Deleuze and Guattari including "actual and virtual realities", "territorialisation, deterritorialisation and reterritorialisation", "subjectivities", "collective assemblages of enunciation" and the "a-signifying rupture". Definitions of these terms, together with an overall explanation of my approach to the authors' texts, are provided in Appendix 1, should the reader wish to cross-reference them. Lefebvre's definition of the term "second nature" is also included in Appendix 1. Although the term "nature" isn't directly referenced in either *Radiating Striations of Centralities* or *The Isorhythmic Refrain*, it does appear in other sections of this document, particularly in the chapter *Rupture*. Admittedly, the definitions provided may not sit comfortably within philosophical discourse. Yet this exegesis is *not* intended as a contribution to a philosophical domain: the exegesis is a description of practice that includes the synthesis of diverse philosophical ideas as a means for understanding and realising an urban sound(scape) design practice. Alternatively, the language of the remaining two conceptual tools, *The Striated Sound(scape)* and *Repatterning the Urban Sound(scape)* are written in a style that is less dense. These conceptual tools lean more towards applications of a making practice rather than theoretical explorations of the spatiotemporal; the more practical voice in which they are written reflects this. The conceptual tools are considered designs, as much as the projects are considered designs. The projects and conceptual tools evolved together, and exist as an active dynamic – an interaction of mind, hand and ear that *is* the PhD.

A final point: the term ‘conceptual tool’ directly references Gilles Deleuze’s view that theory should be used as a tool. Theoretical developments are considered conceptual tools insofar as they are implicit in my practice of creating urban sound installations. The term ‘tool’ is understood as being synonymous with praxis: a melding of practice and theory, in which concepts are only useful when put into practice. Deleuze states that:

“A theory is exactly like a box of tools... It must be useful. It must function. And not for itself. If no one uses it, beginning with the theoretician himself... then the theory is worthless...” (Foucault, 1977, p. 208).

Furthermore, Lefebvre states that “thought strengthens itself only if it enters into practice: **into use**.” (Lefebvre, 2004, p. 69, Lefebvre’s emphasis). My PhD can be considered praxis insofar as it is a melding of theory and practice, in which theory is applied to a making practice, and in turn, reflections on the making practice produce theory in the form of conceptual tools.

Note 2: Notes on the arrangement of the present document

This document has been produced as a multimedia experience. Included in the back of the ADR is an audio compact disc containing thirty-six audio samples. The reader is invited to listen to the audio samples while reading the text, as they serve to illustrate emphases made in the text. Playback is recommended through headphones or a studio monitor pair. The included DVD serves as the appendix. The appendix includes a number of documents that shall be referred to throughout the text: included is a backup of the 36 audio samples, which are saved as data files. In the appendix the folder labelled, *appendix 3 - full sound(scape) recording of Revoicing the Striated Sound(scape)* is a 4-track rendering of the sound installation *Revoicing the Striated Sound(scape)*. Should the reader use the Digital Audio Workstation (DAW) *Reaper*, a session has been set up, ready to load under the folder name *Open This If You Own Reaper*. Otherwise, in the folder named *Rendered Tracks*, the four tracks are labelled track 1 to track 4 and can be loaded into any DAW. Fifty-seven images are arranged throughout the document. At times, clusters of images will act as photostories providing the reader with a visual unfolding of events. These moments will be highlighted before they are encountered. Each of the audio samples and images feature a detailed caption. These have been written so that if a reader were to read the audio captions only, or the image captions only, a certain perspective of the PhD work could be obtained. However, it is suggested that the entire document is read in a linear fashion, as the ADR presents an unfolding narrative. Three figures and three tables are included in the document. Figure 1 is an overview of works completed for the PhD; Figure 2 presents an unfolding narrative of project and conceptual tool completions (discussed in chapters 2 – 5: *Subtraction*, *Addition*, *Bifurcation* and *Transformation*); Figure 3 emerges from Figure 2, and presents an ecological model for urban sound(scape) design that is discussed in the chapters *Rupture* and *Contributions to Knowledge*. Tables 1 – 3 are provided as an overview of key themes, including the six projects, the four conceptual tools, and the affectual design intentions of the ecological model for urban sound(scape) design. The tables have been constructed so that the reader can use them as a reference point while reading the ADR.

1.3 Diagrammatic Guides for Understanding the Research

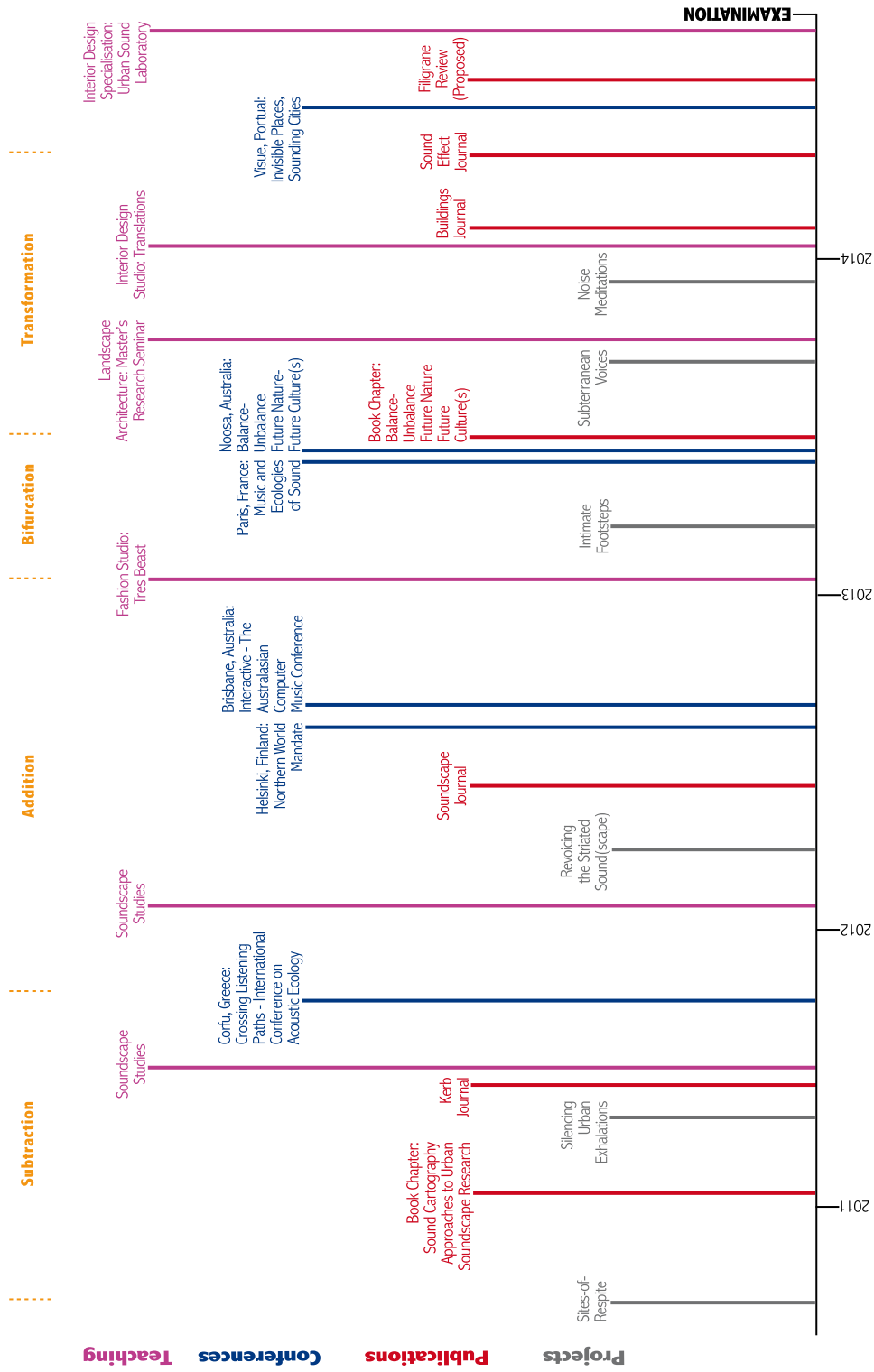


Figure 1: PhD Timeline

The timeline depicts the procession of projects, publications, conferences and studio teaching completed throughout the four-year period of the PhD. The timeline begins with the Sites-of-Respite Project and ends with the examination.

Table 1: An overview of the projects

Project Name	Duration	Project Site	Number of Speakers	Purpose of Project
Sites-of-Respite	July – October 2010	Melbourne Central Business District (CBD) bounded by Spencer, Spring, Flinders and LaTrobe Streets	None	To identify locations within Melbourne's network of laneways as potential sites-of-respite.
Silencing Urban Exhalations	15th July – 5th October 2011	Bowen Lane, RMIT University, Melbourne	None	To investigate changes in an acoustic environment and people's behaviours when a ubiquitous noise source is removed from a busy urban site.
Revoicing the Striated Sound(scape)	July – November 2012	Unnamed laneway behind Little Latrobe St, off Swanston Street, Melbourne	Four, quad configuration	Applying the conceptual tool <i>The Striated Sound(scape)</i> to a sound(scape) design in a laneway. The design merges real and synthesised sounds to provide the laneway with an altered voice.
Intimate Footsteps	4th and 5th May 2013	Design Hub, RMIT University, Melbourne	Eight, cube configuration, with a further 12 in parallel linear arrangement stretching either side of the cube	The creation of a Passion Machine via a rhythmanalysis-induced bifurcation in the PhD process. The Passion Machine reintroduces emotional and passionate expression into alienated public spaces.
Subterranean Voices	1st August – 1st September 2013	The Trench. Beneath Federation Square, Melbourne	Eight, arranged as an irregular and spatially expansive pattern	A rapid application of the conceptual tool, <i>Repatterning the Urban Sound(scape)</i> , in which the merging of real and synthesised sounds creates ambiguous listening experiences which may induce a meditative state.
Noise Meditations	22nd November – 23rd March 2014	National Gallery of Victoria	Stereo (headphone mix)	An exploration of studio sounds synthesised from different site recordings without requiring their integration into site-specific conditions.

In unison with the synopsis and project discovery sections at the beginning and end of each of the project descriptions, the table is designed to provide the reader with a summary of the six projects. The 'Number of Speakers' column represents the range of speaker configurations that have been explored throughout the projects.

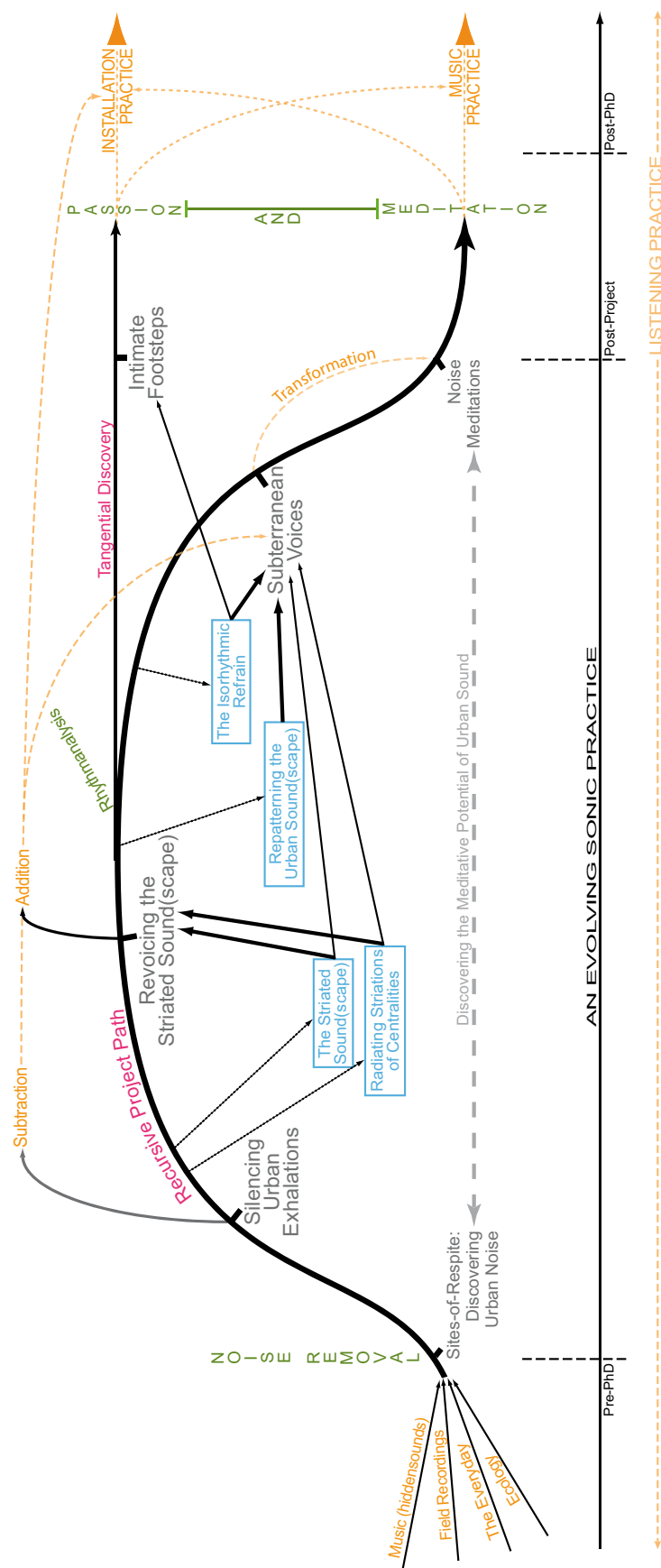


Figure 2: Narrative Arc of Project and Conceptual Tool Completions

Figure 2 shows the recursive approach to design inherent in my PhD process. The PhD, informed by my pre-PhD practices, begins with the intent to remove urban noise, and ends with the discovery of the meditative potential of urban sound. A bifurcation during the PhD, resulting from explorations in rhythmanalysis, points toward a method for introducing passion into alienated urban spaces. The grey, dashed line represents the primary underlying theme of the project work: the discovery of meditative potential through sound interventions in everyday urban sound(scape). The theme emerged throughout the reflective process, pre-, peri- and post-project. The conceptual tools, encased in blue boxes, are critical elements of the iterative process of project development. Project outcomes include methods for producing passionate and meditative atmospheres, which continue post-PhD as installation and music practices. The orange text represents my ongoing music and installation practice.

Table 2: An overview of the conceptual tools

Conceptual Tool Number	Conceptual Tool Name	Project source	Project(s) informed	Summary of Conceptual Tool
I	Radiating Striations of Centralities	Project 1: Silencing Urban Exhalations	Project 2: Revoicing the Striated Sound(scape) Project 4: Subterranean Voices	Realising the tensions between the emanating controls of centralised bureaucracies and the creative potentials of peripheries.
II	The Striated Sound(scape)	Project 1: Silencing Urban Exhalations	Project 2: Revoicing the Striated Sound(scape) Project 4: Subterranean Voices	Discovering the ubiquitous pattern of parallel lines in sonogram visualisations of urban sound(scape) recordings, and applying the pattern as a sound design tool. The pattern is also imagined as a homogenising, mythopoetic Voice of the city.
III	Repatterning the Urban Sound(scape)	Project 2: Revoicing the Striated Sound(scape)	Project 4: Subterranean Voices	A methodology for transforming site-specific sounds: listening to space; recording sounds; transforming sounds and combining the real and the synthesised with sound installations.
IV	The Isorhythmic Refrain	Project 3: Intimate Footsteps (early stages)	Project 3: Intimate Footsteps (latter stages) Project 4: Subterranean Voices	Realising the capturing of urban space – particularly as sonic and gestural subjectivities – into repeating temporal forms.

The conceptual 'tools' are so named as they were applied/employed during the making process in the realisation of public sound installations. They emerged as discoveries of the PhD of equal import to the projects as contributions to knowledge in urban soundscape design.

1.4 Pre-PhD: A Coming Together of Parallel Practices

Sonic Practice: hiddensounds

- 11 I was fortunate enough to attend the first Earthcore events in 1993-4, which were at the time truly astonishing multi-sensual experiences.
- 12 This was, admittedly a naïve fascination at the time. I was recording with a SONY IC recorder, oblivious to the lower fidelity mp3 files it was generating.
- 13 Although these performances form part of my practice and would help shape the thinking that would become part of my PhD, they are not considered within the context of my PhD projects. However, if the reader is interested in further exploring these performances they can be found at www.hiddensounds.net (accessed 21/05/2014).
- 14 I originally called hiddensounds an audio-scrawl project, as I have been equally fascinated by the written word and its capacity, like sound, to create new worlds.
- 15 www.hiddensounds.net (accessed 21/05/2014).
- 16 There is a link to my blog on the hiddensounds website www.hiddensounds.net (accessed 21/05/2014) that includes philosophical and political ruminations, and updates on hiddensounds' performances and installations.

I have always had a preference for playing instruments that favour lower-frequency sounds. When my high school friends gravitated towards electric guitar, I gravitated towards electric bass guitar. I heard electronics for the first time in the early 1990s Melbourne Rave scene¹¹, and some years later discovered a Nord Modular synthesiser and a Korg Electribe S MKII beat sequencer. I was drawn to the instruments' capacity to produce low-frequency beats and modulating drones. A fascination with field recordings¹² developed in the early 2000s. The possibility of combining typically disjointed worlds in one place led me to develop a number of musical performances¹³ along this theme. Within these performances I combined my three areas of musical interest – electric bass guitar, electronics and field recordings. I called my sound project¹⁴ *hiddensounds*. I have a website¹⁵ where the project's ongoing activities are documented (see Image 1).



Image 1: hiddensounds website logo

The picture on the homepage of my website. The image conveys my primary pre-PhD sonic interests – electric bass guitar, electronics and field recordings.

Hiddensounds refers to the capacity of sound to evoke experiences or emotions that may otherwise be unknown to the listener. Hiddensounds also refers to my belief that within sound there is limitless potential; part of the joy of being a sonic practitioner is discovering sounds typically hidden within instruments and everyday objects. Hiddensounds, therefore, are mysteries inherent within the everyday world that, through creative engagement, can be actualised – brought *into* life – and thus transcribed upon the everyday experiences of life.

Parallel to my sonic practice is my teaching practice. I worked as a secondary school teacher for ten years in remote regions and large cities of Australia and England. Since 2011 my teaching practice has evolved into the delivery of tertiary level sound-based research seminars and studios as detailed in Figure 1, page 10. Additionally, I have had an interest in environmental activism since studying Environmental Science in the early 1990s, which has informed my pedagogical approach, particularly as a secondary school teacher. Finally, writing has been an enduring interest, mainly in the form of personal diaries, but also in public forums such as blogs¹⁶.

Finding Acoustic Ecology: Education, Environmental and Writing Practices

These apparently parallel interests in my life – music, environmentalism, education and writing – came together in a most unexpected way in 2010 when I enrolled in the Soundscape Studies cross-university elective at RMIT University. The soundscape studies elective was developed by my supervisor-to-be, Associate Professor Lawrence Harvey, who had developed the elective with an activist and interventionist objective¹⁷ in line with the activities of the World Soundscape Project (WSP) and its descendent the World Forum for Acoustic Ecology (WFAE). I discovered the works of Murray Schafer, Marshall McLuhan and Edmund Carpenter¹⁸, Bernie Krause, Stephen Feld, Barry Truax, and Hildegard Westerkamp. I approached Lawrence Harvey towards the end of the elective to tell him I was fascinated with Marshall McLuhan and Edmund Carpenter's *Acoustic Space* and its engagement with mysticism¹⁹, particularly the discussions of mysticism in relation to sound. In the ensuing conversation he suggested that I might want to consider pursuing an as yet undeveloped finding within SIAL Sound Studio's 2006 *Citysounds*²⁰ report, which had been recently completed with the City of Melbourne. I consider this moment to have initiated my PhD work.

17 For further discussion see Harvey, 2008, p.260.

18 Marshall McLuhan and Edmund Carpenter, of course, were not Acoustic Ecologists. However, their article, *Acoustic Space*, was introduced to us during the elective. The article had a profound impact on me and inspired me to pursue a PhD.

19 "Mysticism, Intuition, are bad words amongst scientists..." (McLuhan and Carpenter, 1960, p.66) is the line that first caught my interest.

20 For more information on this report see: <http://www.rmit.edu.au/architecturedesign/sial/soundstudio/projects/citysounds2> (accessed: 28/07/2014).

2 Subtraction: removing noise from urban sound(scape)s

2.1 Project 1: *Discovering Urban Noise*

Project Synopsis: *Discovering Urban Noise*

The *Sites-of-Respite* report was completed between July to October 2010. The project included a thorough exploration of laneways and arcades, listening exercises and recordings within Melbourne's Central Business District, with the aim of finding spaces that were free of noise, and thus suitable as sites-of respite.

The Sites-of-Respite Report

Two virtual sites-of-respite were designed for the interactive digital world created for the *Citysounds* project: a water feature, and a site dominated by wind chimes²¹. In both instances survey results concluded that the majority of respondents desired that sites-of-respite exist in urban spaces. Accordingly, the Sites-of-Respite report investigated spaces in the Melbourne CBD that could be potentially developed as sites-of-respite. The Sites-of-Respite report was constructed upon axioms inherent to an Acoustic Ecology approach to urban soundscape design²²: replace lo-fi (noisy) soundscapes with hi-fi (healthy) soundscapes²³. As revealed in the literature review attached to the report, this approach to urban soundscape design is supported by an abundance of academic research which demonstrates that noise is a health issue²⁴, and studies providing evidence that people feel more at ease in spaces characterised by nature sounds²⁵.

After an extensive two-week exploration of Melbourne's network of laneways in August 2010, I decided upon a total of six potential sites (see Image 2). An important discovery was that although Melbourne's network of laneways are characterised by high brick walls (as seen in Image 2) that attenuate traffic noise, all laneways contain the sounds of air-conditioners and ventilation outlets. An example is provided in Audio Sample 1. The only exceptions are laneways in which the sounds of restaurant patrons define the acoustic space, as heard in Audio Sample 2.

21 See <http://www.rmit.edu.au/browse;ID=7t6t88ggjxks> (accessed 20/05/2014) for a YouTube clip that includes sample survey questions, and a site-of-respite within the virtual world created for the *Citysounds* report.

22 In this instance, I am specifically referring to attitudes toward urban soundscape design in the domain of Acoustic Ecology. Other approaches include concert performances and education as a means to propagate messages relating to the importance of healthy and well-balanced soundscapes.

23 Barry Truax describes *lo-fi* and *hi-fi* soundscapes in the following passage: "Situations where signal detection is difficult or impossible may be termed 'lo-fi' environments, by analogy to electroacoustic signals of poor quality, high noise, and distortion. The complementary situation, the 'hi-fi' environment, is one in which all sounds may be heard clearly, with whatever detail and spatial orientation they may have. Such an environment is, by definition, balanced and well 'designed', whether the design is intentional or the result of natural causes..." (Truax, 2001, p.23).

24 There are many studies that have reached similar conclusions: noise from traffic and aircraft poses a health risk. See for example Goines and Hagler (2007), Sharp (2010) and Lars and Babisch et.al. (2008).

25 There are numerous studies suggesting that people prefer nature sounds to mechanical and technological sounds. See for example Gidlof-Gunnarsson and Ohrstrom (2007) and Jian Kang (2007). However, some studies also suggest generational and cultural variations in attitudes towards noise. For example Kang (2007) posits that young people are less enamoured with natural sounds than older generations. And a study by Guastavino (2006) reports that people in French cities like the mechanical sound of trains and trams as they attach such sounds to environmental responsibility. These variations challenge the dualistic account provided by Barry Truax and the Acoustic Ecology movement, as described in footnote 23.



Image 2: The six identified sites-of-respite

The top photo in the middle features the bike I used to visit every laneway in Melbourne. After deciding on six sites, I took stereo recordings of each, using the microphones visible in the bottom right photo. These sites were considered potential sites-of-respite, based on their quietness relative to listener experience of the immediately surrounding ambience: typically main roads with higher background sound levels.

Audio Sample 1: Ventilation outlet (31s)

A ventilation outlet is heard while the listener transitions into the potential site-of-respite, Manton Lane. Note also the high-pitched buzz toward the end of the recording. As this was one of the quietest laneways discovered in the report, the audio sample is suggestive of just how predominant buzzes and drones are in the Melbourne CBD.

Audio Sample 2: Laneway restaurant (31s)

A Melbourne laneway full of people dining and drinking coffee. While city sounds are still prevalent, the buzzes and drones of the city are masked by the sounds of socialising. The audio sample suggests that while we may not find quiet in the city, we can find the comforting, even energising sounds of social activity.

I was frustrated at the time – it seemed impossible to locate a site-of-respite in a city dominated by the drones of air-conditioners and ventilation outlets – although in retrospect, the search was futile: I was simply encountering a limitation within the Acoustic Ecology agenda. The production of *hi-fi* sound(scape)s within contemporary urban sound(scape)s that are defined by noise is not possible. It's true that there were some places that were quieter than others, but hardly spaces that could be considered *hi-fi*. During my research for the sites-of-respite report, I noted the city's myriad churches, which seemed to adequately provide the desired *hi-fi* sound environment. I wondered if churches could be reimagined as non-religious spaces



Image 3: Helsinki Kampii Chapel of Silence

I took this photo on 23/05/2012 near the end of its construction. The structure attempts to reproduce the benefits of silence and contemplation found in a church, using modern architectural techniques and a secular countenance.

for quiet contemplation?²⁶ Such a possibility has been pursued in the City of Helsinki. The K2S Architect designed *Chapel of Silence*²⁷, seen in Image 3, is free of religious iconography but replete with the experience of contemplative silence, which offers an escape from the noises of the city.

The *Sites-of-Respite* report caused me to question Acoustic Ecology's attitudes towards urban noise. Noise, particularly from air-conditioners, ventilation outlets and exhaust outlets, was a ubiquitous and inescapable presence throughout the Melbourne CBD. Furthermore, it seemed the numerous churches spread throughout the city already provided sites-of-respite. Limitations in the Acoustic Ecology agenda were becoming apparent to me even at this early stage: it seemed an unrealistic fantasy to expect spaces of contemplative silence in the outdoor public spaces of our cities²⁸.

Project Research Outcomes: *Discovering Urban Noise*

The *Sites-of-Respite* report concluded that air-conditioning and ventilation sounds were ubiquitous throughout Melbourne's network of laneways. While the high walls of laneways provided relief by attenuating traffic noise, laneway potential for the provision of quiet spaces was compromised by air-conditioning and ventilation sounds. It was at this point in my practice that a new relationship with urban noise was beginning to emerge, as it was clear to me that removing noise was going to be a complex and unrealistic option.

26 St. Michael's Uniting Church on Collins Street, Melbourne has attempted to create a non-denominational quiet space called *Mingary*. Unfortunately it fails to fulfill the criteria for a site-of-respite, due to its doors opening onto an exceptionally busy streetscape. The sounds reflect inside the small tiled space, which is hardly conducive to quiet contemplation.

27 See Bostwick (2012) for more information.

28 It was at this point that I discovered Bjorn Hellström's 2003 study, *Noise Design*. Hellström is critical of the Acoustic Ecology agenda, and suggests a design approach to urban sound that designs urban noise through sound-art approaches, rather than an exclusive focus on the removal of noise. His argument had a significant influence on my unfolding approach to urban sound(scape) design.

2.2 Project 2: *Silencing Urban Exhalations*

Project Synopsis: *Silencing Urban Exhalations*

Silencing Urban Exhalations involved the shutdown of an exhaust outlet in Bowen Street, RMIT City campus, Melbourne on 05/11/2011. The project was part of a pedagogical exercise in which RMIT Soundscape Studies students were involved in the removal of the noise source. The noise source dominates the acoustic space of Bowen Street, which is central to RMIT university life as both a social space and a space of transition.

Silencing Urban Exhalations was completed in October 2011. The project involved the subtraction of noise emanating from an exhaust stack situated at the centre of RMIT University's city campus. The shutdown of the noise source lasted for 30 minutes, from 3pm to 3.30 pm, on 05/10/2011. The exhaust stack, as seen in Image 4, removes exhaust fumes from a delivery bay situated directly beneath the stack. It is a startling example of poor acoustic design in which the effects of noise on social space have been completely ignored. Audio Sample 3 is a recording demonstrating the noise's domination of the space, which is further exacerbated by its location beneath a black metal awning (seen in Image 4), which reflects sound, thus intensifying the volume of the noise.



Image 4: Site of the exhaust fan

The exhaust stack pictured produces a loud and constant drone in a socially active space at the heart of the RMIT city campus. To the left, a stall (part of a market held weekly on the site) is visible. The site is also used as a meeting space and event space and is a transitory route between several important buildings.

Audio Sample 3: Exhaust outlet recording (20s)

The constant noise has an effect on speech intelligibility, as heard in this recording. The noise, much like the physical object from which it emanates, is given central importance in the space. Note that the human voices seem distant, although they are in fact close to the microphone.

Related Works

The project connects with various sound practices that subtract sounds in public spaces. In 2002, sound-designer Lawrence Harvey temporarily removed rooftop sound sources in Bowen Lane and reported that “the descending glissando of a large unit shutting down [was] heard, along with a slight change in the sound spectrum quality of the site” (Harvey, 2008, p. 56). In 2011, the landscape architect Peter Zumthor created the Serpentine Pavillion Gallery at London’s Kensington Gardens, in which he asked gallery staff to switch off a noisy public address system so the silence of the space could be appreciated.²⁹ In his 1983 sound work *Time Piece*, sound-artist Max Neuhaus included a “twenty minute cycle [that] direct[s] attention through both an addition and subtraction: we begin with silence, then increase the additional sonorous layer, only to remove it in a way so as to heighten consciousness of what is already there” (LaBelle, 2006, 158). *Silencing Urban Exhalations* is a variant of these examples, insofar as I was specifically interested in the effects on social space, and thus human behaviour, that would occur by subtracting a dominating noise source.

Spatial and Perceptual Effects of the Shutdown

Those who perceived changes

The moment of the shutdown was a significant event for my students and myself. My students had gone through a process of ear-cleaning³⁰ described by Schafer as “a systematic program for training the ears to listen more discriminately to sounds, particularly those of the environment” (Schafer, 1977, p.272), which included soundwalks, intensive listening exercises and sound-mapping exercises. The moment of shutdown resulted in an instant transformation of the acoustic space of the intervention site. Human voices were foregrounded, rummaging through items in nearby market stalls could be clearly heard, and the sounds of the distant city were audible due to an increase in the acoustic horizon³¹. Audio Sample 4 is a stereo rendered recording of the shutdown, which was recorded with an Ambisonic Soundfield microphone and Sound Devices 744T field recorder.

Audio Sample 4: Shut-down (32s)

This audio recording captures the transformation of the space at the moment of shut-down. What feels like an enclosed space suddenly expands outward, and a more diverse range of sounds, particularly human voices, emerges. This is a result of the expanded acoustic horizon and the removal of the masking effects created by the exhaust outlet.

These observations were consistent with data collected during the shutdown. 1/3 band octave sound levels were recorded on site before

29 See Heathcote (2011) for further discussion.

30 On a personal note, as someone who has had a long-time issue with earwax build-up that has required constant cleaning by my local doctor, I wish Schafer had arrived at a more elegant term.

31 The acoustic horizon is defined in the *Handbook for Acoustic Ecology* as “the farthest distance in every direction from which sounds may be heard” (Truax, 1999).

- 32 Filtration is an effect defined by CRESSON as “a reinforcing or weakening of specific frequencies of a sound” (Augoyard et al., 2006, p. 48).
- 33 One could possibly argue that the masking effect affords speech privacy, which allows interlocutors an opportunity for intimate or private talk in public spaces. It is interesting to consider that perhaps noise offers such opportunities in public spaces, and that by removing noise, an unwanted acoustic transparency is created; a further challenge to Acoustic Ecology's attitudes to urban noise.

and during shutdown, represented in graphical form in Image 5. When the exhaust stack was operating, a significant increase in the volume of frequencies above 125Hz was identified, particularly between 500 and 4000 Hz, a filtration³² phenomena caused by the metal awning. As a result a mid-frequency drone is dominant, as heard in Audio Samples 3 and 4, which heightens the intrusion of the noise into the frequency range of human speech. I remember observing three people in conversation near to the stack. Typically people are huddled close together due to the masking effect of the dominant noise source³³, but with the noise source removed, the conversationalists stood at least one meter apart, a symbolic representation, I thought, of the humanisation of the site – a space suddenly appropriated (to use the language of Lefebvre) as social space.

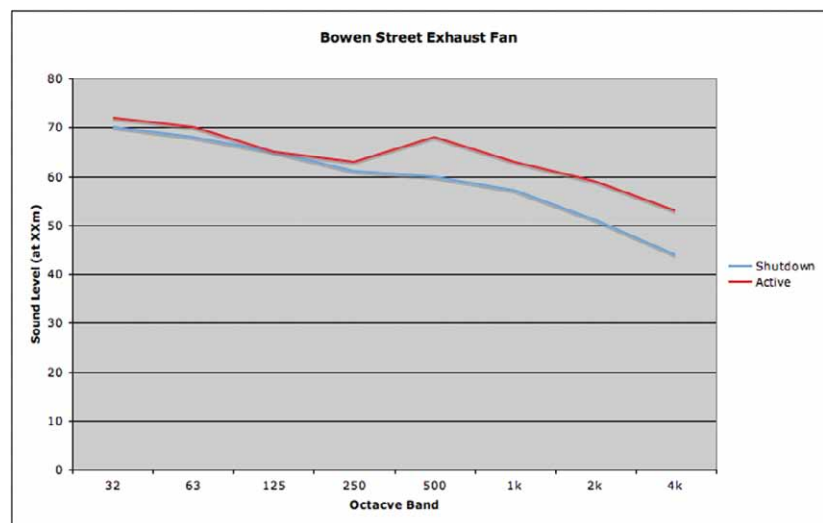


Image 5: Data comparing sound levels at the site

The red line represents the sound level and octave bands generated by an active noise source and the blue line represents similar data generated during shutdown of the noise source. Note that the decrease in sound levels is highest at 500 Hz and above, which accounts for the foregrounding of the human voice upon the removal of the noise.

Those who perceived no changes

A number of the students' friends were at the site during the shutdown. Some of my students, at the moment of shutdown, asked their friends if they noticed any change. Although only a couple of meters away from the noise source, their friends replied that they noticed *no change in the environment* at all. This includes both the shutdown, and half an hour later, the reintroduction of the noise. These student reflections were affirmed by my own observations. During the shutdown I noticed a stallholder, who is often situated beneath the exhaust stack (the stall can be seen in the background of Image 4), was looking up during the shutdown, whereas I had noticed on previous visits that the stallholder is typically looking towards the ground. I had always considered this to be a visual metaphor for the oppressiveness of the noise source. However, one of my students reported that she had asked the stallholder if any changes were noticed in the space. The stallholder answered that *no change in the environment* was noticed, and the only reason he was looking around was that he had heard news that something significant was going to occur in the space!

These observations had a significant impact on my approach to sound(scape) design. Although the Acoustic Ecology movement, and a diverse range of academic papers I have read (see footnotes 24 and 25), assume that noise removal should be axiomatic to urban soundscape design, the anecdotal evidence I collected during *Silencing Urban Exhalations* suggested that it is unlikely most people, beyond my attuned students, noticed *any* changes to the environment. It is possible that this lack of awareness by the public is attributable to what Barry Truax and Michael Bull term the “alienated listener”, who withdraws from the life of the city.³⁴ But if urban noise has such a negative impact on the listener, then surely the overt situation of removing a dominating noise source from a social space should come to the public’s immediate attention? Any way I wanted to consider it, it was clear to me that the temporary removal of the noise source was of little consequence to many of those in the space during the shutdown.³⁵ The perception of sound, in the case of *Silencing Urban Exhalations*, was more suitably explained from a phenomenological position³⁶ rather than the dualist position of the Acoustic Ecology movement: one person’s noise is another person’s sound, is another person’s obliviousness. However, I maintain that the subtraction of noise remains an important approach to urban sound(scape) design, if only for those attentive listeners who are positively affected by its removal.

Towards conceptual tool 1: Discovering Bureaucratic Power Networks That Protect Noise

A further important discovery within this project was the identification of bureaucratic power networks that protect noises in urban spaces. The simple act of flicking a switch instantly activated a network of concealed bureaucracies that emerged to protect the presence of the noise. As described in a paper I presented at the 2012 Cumulus Helsinki Conference, entitled *Revoicing the Striated Soundscape: a Case Study of Student Soundscape Design Interventions at RMIT University*: “Over a period of three months, the following university departments were contended with on a weekly and sometimes daily basis” (Lacey, 2012, p. 16)³⁷: Property Services, (which includes Fire Services and Facility Services, responsible for air-conditioning maintenance); the Client-Relations Manager; the School of Design and Social Context (including the Health & Safety Officer, the Audio-Technical Manager and the Ethics Committee). Other University units encountered included Student Union Officials, Market Stall Holders, Cleaning Services (who complained on the day that their route to near-by rubbish bins was being blocked), and finally, RMIT Security kept a presence, and occasional passers-by surveyed the area and made concerned phone calls.

It took three months to organise a shut-down that lasted only 30 minutes, and the shutdown was only deemed acceptable as it was attached to a student project. It seemed extraordinary to me at the time that I had to go through so many bureaucratic channels to implement such a simple procedure. The experience identified just how difficult it would be to implement a citywide removal of noise sources for extended periods of time. These reflections mark the beginning of the development of the first conceptual tool, *Radiating Striations of Centralities*, which explores the tensions between creative transformations and political and bureaucratic domination of urban space.

34 Truax suggests that “people feel alienated by machine sounds” (p.63) and Michael Bull (2000) suggests that the use of iPods presents an escape from the external environment in which, “they are not concerned with aesthetically drawing in the urban world but rather with solipsistically transcending it” (p.143).

35 I was fortunate enough to have some correspondence with Barry Truax on this matter. Included in his thoughtful reply was this comment: “When you stopped the exhaust (which must have been a great moment), you observed the lifting of the masking effect and the expanded horizon. If that had gone on for some time, I would have expected the dynamics of interaction in the space to change. In other words, the mediating role of sound in the space to reduce listening and soundmaking could have turned to the opposite...”. Suggestive in Truax’s statement is that with a prolonged absence of the sound source, social changes would have become more pronounced. I don’t doubt this, and indeed it asks one to imagine what a citywide shutdown might achieve. However, as I am unable to pursue such a possibility in the context of the PhD, I leave the comment here as conjecture.

36 In the sense of Johan Redstrom’s argument that Acoustic Ecology is phenomenological and not ecological: “soundscapes is about the experiences of sound... making this approach essentially phenomenological” (Redstrom, 2007, p. 1). Bull’s argument is also phenomenological, but his findings seem consistent with Truax insofar as the negativity of experiences of urban sound is foregrounded.

37 The bureaucratic complications were exacerbated by the fact that, on a separate day to the shutdown, I was asking my sound students to use the space for electroacoustic interventions. Still, this seemed a relatively small-scale and context-relevant event for an educational institution, in comparison to the bureaucratic clearances required. See Lacey (2012) for more information.

2.3 Conceptual Tool I: *Radiating Striations of Centralities*

A brief note regarding the conceptual tools

38 This conceptual tool was included in a paper I wrote for *Sound Effect: An Interdisciplinary Journal of Sound and Sound Experience* (Vol. 3, No. 3) titled "Conceptual Overlays for Urban Soundscape Design Emerging from a Transversal Analysis of Lefebvre, Deleuze and Guattari, and Arendt".

39 Subversive methods are by no means easy options, with perhaps the exception of strikes or the more recent phenomena of flash mobs. See <http://six.fibreculturejournal.org/fcj-030-flash-mobs-in-the-age-of-mobile-connectivity/> (accessed 09/07/2014) for a conversation of Deleuze and Guattari's relationship to this phenomenon.

The first conceptual tool: *Radiating Striations of Centralities*³⁸ emerged near the completion of *Silencing Urban Exhalations*. I was reading two texts at the time: Lefebvre's *The Production of Space* and Deleuze and Guattari's *A Thousand Plateaus*. Although I was already aware of these texts, the books came to my attention again as they are intellectual staples amongst many of my colleagues within the school of Architecture and Design at RMIT. The readings fascinated me, as they provided me with a language that enabled me to articulate my experiences while making the projects. I consider it philosophy 'coming to life' through the process of making; to be clear, the concepts emerge as spontaneous realisations during a making practice, before they are shaped, through thinking, into conceptual tools. They are praxis, in so far as they cannot be considered outside the context of making – the conceptual tools are reflections on a making practice, and form a part of that practice. Furthermore, the conceptual tools are reassemblages of philosophical ideas that are idiosyncratic to my practice; as such, I don't expect these tools to be considered as contributions to philosophy, but as potentially applicable tools by practitioners who design urban sound(scape)s.

Radiating Striations of Centralities

Lefebvre's understanding of space as fragmented according to a rational order is conceptually synonymous with Deleuze and Guattari's striated space, which conceives of space as carved, divided and bound. In *The Production of Space*, Lefebvre's states:

"A classical rationality... appears to underpin various spatial distinctions and divisions. Zoning, for example, which is responsible - precisely - for fragmentation, break-up and separation under the umbrella of a bureaucratically decreed unity ..." (Lefebvre, 1991, p. 317).

Understanding space as representational of a rational order imposing controls on lived experience exposes challenges to creative design intervention in the city, while simultaneously illuminating lines of flight from these controls via bureaucratic cooperation and/or subversive methods.³⁹ For the creative practitioner, cooperative methods consider the controls on space that emanate from central bureaucracies, while subversive methods challenge the striated as if peripheral striated spaces were disembodied from their central genesis. Comparative examples can be found in government funded art-projects, wherein the designer acknowledges the centrality of control, and illegally applied street art, in which centrality is ignored in favour of the conditions of the peripheral. Lefebvre further elaborates on the effects of dominated space on lived experiences:

"As a body of constraints, stipulations and rules to be followed, social space acquires a normative and repressive efficacy... that makes the efficacy of mere ideologies and representations pale in comparison" (Lefebvre, 1991, p. 358).

Thus, bureaucratic power dominates urban space by informing the social spaces of cities; power networks that only become apparent when action that contradicts the bureaucratic programming of space

is present. As discussed in section 2.2 above, this was experienced in the project *Silencing Urban Exhalations*.

Deleuze and Guattari introduce their concept of Striated and Smooth space in two chapters of *A Thousand Plateaus: Treatise on Nomadology - the War Machine*, and *The Smooth and the Striated*. Striated space can be interpreted as the built environment: our towns, cities and agriculture, “parallel verticals (that) have formed an independent dimension capable of spreading everywhere” (Deleuze and Guattari, 1997, p. 408); smooth space can be considered the space of the nomads, deserts and steppes (or to generalise, the “natural”), whose relationship to space is vortical (where any point of space can be occupied at any point of time). The creative practitioner acts to reimpart smooth space within striated space by deterritorialising bureaucratic controls of urban milieus in order to foster the emergence of creative lived experiences – the boundless condition of the nomad.

The discussion of striated and smooth is not dualistic; striated and smooth spaces are characteristics of space in constant interaction, which cause a multiplicity of becomings:

“... we must remind ourselves that the two spaces in fact exist only in mixture: smooth space is constantly being translated, transversed into a striated space; striated space is constantly being reversed, returned to a smooth space” (Deleuze and Guattari, 1997, p. 524).

The argument that there is a continuously active mixture of striated and smooth spaces can be understood, from a sound(scape) design perspective, as first identifying the smooth (spaces where the virtual can manifest) within the striated (controlled spaces of captured subjectivities), thereby identifying lines of flight, that is, the potential emergence of subjectivities within the peripherally located (i.e., temporarily uncontrolled) nomad. This is an affective design response to urban space, where designing the return of smooth space produces affective environments in which the urban nomad can emerge. However, focusing on the peripheries risks becoming a fantasist’s notion, as it is clearly bureaucracies – by continuously affecting striations across global space⁴⁰ – that are in the continuous ascendant. Accordingly, the sound(scape) designer must respond to the exigencies of centralised controls while maintaining a creative focus on the periphery created by these striations as the site for creative emergences.⁴¹

Lefebvre was critical of thinking that focused exclusively on the periphery, emphasising instead the importance of recognising the power of centralised bureaucracies to impose controls on (social) space. Stuart Elden quotes Lefebvre as suggesting:

“that [the then] contemporary concentration on marginal/peripheral groups ‘neglects the centres and centrality; in a word the global. These are pin-prick operations, suggesting that we should ‘enjoy ourselves! Don’t work! We are all delinquents, sexually obsessed, schizophrenics.’ By this it is clear he has Deleuze and Guattari in his sights...” (Elden, 2004, p. 240).

Although I think Lefebvre’s critique of Deleuze and Guattari possibly ignores the philosophy of immanence and multiplicities that informs their (at least Deleuze’s) writings,⁴² his point that Deleuze and

40 At the time of writing, developers in the Australian state of Victoria were being granted access to build accommodation in National Parks, once sacrosanct spaces free from development. This is further demonstration of Lefebvre’s observation of capitalism’s ability to reinvent itself through the production and domination of space. One may think it is only a matter of time before the deep sea and the peaks of mountaintops are colonised. See <http://www.theage.com.au/environment/national-parks-to-be-opened-up-for-development-20120823-24o1q.html> (accessed 30/07/14).

41 This approach will become clearer in Project 3: *Revoicing the Striated Sound(scape)* in which centralities and peripheries clash and merge in various ways requiring a continuously active design response throughout the project.

42 Deleuze’s final paper “Immanence: A Life”, which is included in *Pure Immanence: Essays on a Life* describes the relationship between immanence and multiplicities. I find the paper provides me with a convincing metaphysical account of the immanence of the real, but it does not help me account for the bureaucracies, which push back against my public installation works. I need Lefebvre for this, which is why I bring their philosophies together in my conceptual tools.

Guattari ignore centralities is an important assertion. It is *the* point of difference between the thinkers that *becomes* the point of fusion of theoretical assimilation into sound(scape) practice: Lefebvre as the spatial practitioner who accounts for the dominance of centralised bureaucracies, and Deleuze and Guattari as creative theorists who present multiplicitous ways to create transformative moments. The conceptualisation of striated space as emanating from centralities provides a focus for action, that is, identifies controlling agents against which to struggle. All urban striations have a source that, if recognized, can assist the sound(scape) designer (practically and imaginatively) in the formation of sound(scape) installations. A combinatory approach to centralities and peripheries by the creative practitioner aims to transform striations that radiate from centralised controls, by simultaneously responding to peripheral striations while seeking complementary approaches with the genesis of these striations.

Lefebvre's concept of fragmented space controlled by a rational order provides a context for understanding how striations emerge from centralised bureaucracies; and Deleuze and Guattari's description of the reimpacting of smooth space provides context for the reappropriation of space through creative design intervention. Striated space can be considered the production of space in regard to the domination of space by bureaucracies, where space is carved and sectioned for functionalism, while the reimpacting of smooth space can be understood as the continuous attempt by the creative practitioner (and/or the urban nomad) to reappropriate urban space for imaginative lived experience. While bureaucratic controls of space are expressed through its fracturing and striating of space, the power of the creative act is its capacity to reimpact smooth space, thus affecting unbounded sensual and imaginative relationships with the city. The role of sound(scape) design is unique in this tension; it is difficult to materially reimpact the smooth in spaces dominated by concrete and steel, but sound is fluid, flowing and amorphous: the field of sounds, and its effects, can emerge and recede in an instant.

3 Addition: adding sounds to the urban environment

3.1 Conceptual Tool II: *The Striated Sound(scape)*

Silencing Urban Exhalations was an incredibly rich project, as it revealed to me two conceptual tools. The first, *Radiating Striations of Centralities* revealed the coexistence and tension of the central and the peripheral that the sound(scape) designer must contend with when working in public space. The second conceptual tool, which emerged from the project, *The Striated Sound(scape)*, reveals a characteristic of peripheral space that affords creative interaction. The very presence of *The Striated Sound(scape)* provides opportunities for the practitioner to creatively respond to its presence, assuming that the dominating networks which spread from centralities are appeased for long enough to allow for the intended creative emergences. While *Radiating Striations of Centralities* attempts to weave together certain spatial explorations of Lefebvre, and Deleuze and Guattari to produce a conceptual tool that effectively responds to the tensions in urban spaces that exist between controlling centralities and creative peripheries, *The Striated Sound(scape)* emerges as a design tool that reimparts the smooth within the striated through the addition of sound; an approach which directly translated into project 3: *Revoicing the Striated Sound(scape)*.

Discovering *The Striated Sound(scape)*

I recorded the shutdown with an Ambisonic Soundfield microphone and Sound Devices 744T field recorder. The recording was decoded to a stereo file, which can be heard in Audio Sample 3 and Audio Sample 4. I produced a sonogram of the recording using Audiosculpt.⁴³ Image 6 is a sonogram of the moment that the exhaust fan is shutdown.

While producing this sonogram, I was in the process of reading Deleuze and Guattari's concept of striated and smooth space, passages of which are discussed at length in the *Radiating Striations of Centralities* conceptual tool. While I was studying the sonograms, a passage stood out to me: striated space can be understood as "parallel verticals (that) have formed an independent dimension capable of spreading everywhere" (Deleuze and Guattari, 1997, p. 408). It occurred to me that the broadband sounds of air-conditioners, ventilation outlets, and exhaust fans that dominate the lower frequencies of nearly all of my urban sound recordings have this characteristic (see Image 7): *an independent dimension that has spread everywhere*.

43 Audiosculpt is a software program created at IRCAM studios for viewing, analysing and processing sounds. For more information see: <http://anasynth.ircam.fr/home/english/software/audiosculpt> (accessed 30/07/2014).

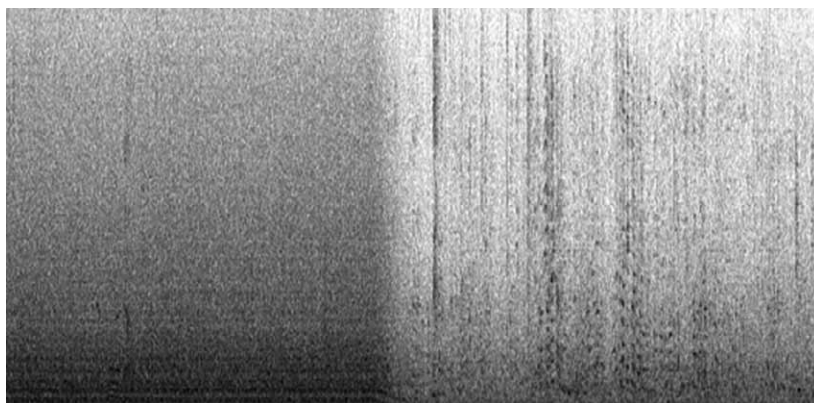


Image 6: Sonogram of Shutdown

The sonogram is a striking visual representation of the listening experience in the space. The sonogram is of a continuous 32-second recording, which is equivalent to Audio Sample 4. The noise source casts an acoustic fog upon the space. Upon its removal the voice formants appear to spring forth.



Image 7: Sonogram of McLean Alley

The bottom section of a sonogram (expanded) of a recording from Mclean Alley, one of the potential sites-of-respite. A similar pattern can be seen at the bottom of Image 6, before the exhaust fan is shut down. This is what I came to call *The Striated Sound(scape)*.

44 *The Collective Assemblage of Enunciation* is a term utilised by Felix Guattari in *The Three Ecologies*. I understand the term to mean a subjectivity (an expression) that has captured a large number of people. In the case of urban sound(scape)s, we might say that the ubiquitous presence of the striated sound(scape) produces an affective response of silent acceptance through its omnipresence. This explanation, for me, provides another context for the observations of people's behaviours in *Silencing Urban Exhalations*: just because people don't notice the noise source, doesn't mean its not affecting them in some way. Unlike the alienated listener who consciously withdraws from the soundscape (a phenomenological explanation), the striated sound(scape) (an affective explanation) produces a silent acceptance of its omnipresence. For further discussion on the collective assemblage of enunciation, please refer to appendix 1.

It was an eerie moment – as if this ever-reproducing and homogenising form had revealed itself to me like the spectre of some ghostly presence lingering in a photograph. It is these very striations of space that people don't notice (like the friends of my students who did not notice the shutdown); a ubiquitous, audible force that shapes the collective assemblage of enunciation⁴⁴ and in doing so, normalises its homogenised, incessant presence. I came to see these striations as *Voice*: a moan or hum that the city expresses everywhere. In this thing we disdainfully call "noise", I suddenly perceived the *Voice* of our city, calling out everywhere. But what was it saying? I wanted to decode this message, to understand this *Voice*. This was a moment of mythology, which is the lingering trace of Acoustic Ecology in my research. I now perceived the noises of the city not as an irritant to be removed, but rather the *Voice* of a heaving Leviathan, which human society had created and to which human society was subjected. A sprawling, homogenous *Voice*, that with creative applications of *The Striated Sound(scape)* conceptual tool, might be disposed to vocal diversifications – its potential effects multiplied, from the homogenous to the diverse. It is this moment – the simultaneous grasping of *The Striated Sound(scape)* and the *Voice* of the city – that came to inform my future PhD work.

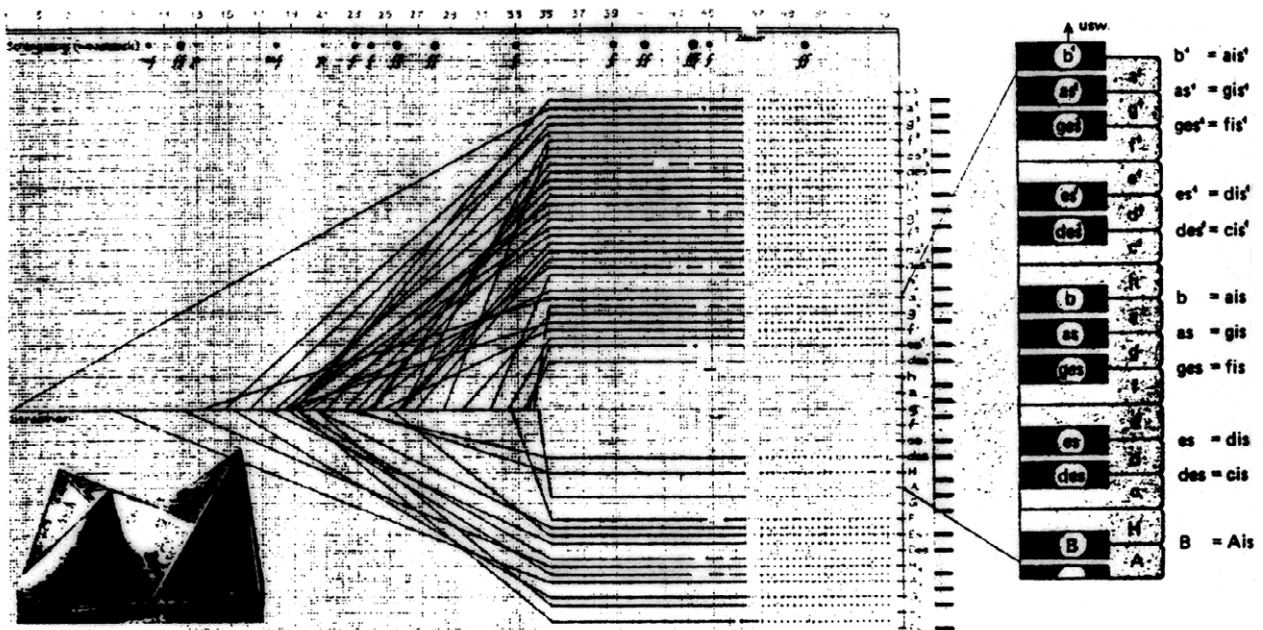


Image 8: Preliminary Sketch for Xenakis' Metastaseis

Deleuze and Guattari's description of the capacity to reimpair the smooth within the striated by drawing lines diagonally across the horizontal and vertical is illustrated in Xenakis' preliminary sketch for his composition *Metastaseis*. These reflections came to influence my own experimentations in transforming the striated sound(scape) using Metasynth.⁴⁵

Towards Project 3: Experimentations with Striations

My supervisor, upon observing the importance of sonograms to my work, introduced me to Metasynth, an image-to-sound software program. I immediately set about importing striated sonogram images into Metasynth's image-synth, and exploring ways to transform them – or, as I came to think of it, transforming the homogenised *Voice* of the city into multiple expressions. At the same time I came across the following quote by Deleuze and Guattari (1997), which reflects upon the reimpairing of the smooth within the striated:

"Returning to the simple opposition, the striated is that which intertwines fixed and variable elements, produces an order and succession of distinct forms, and organises horizontal melodic lines and vertical harmonic planes. The smooth is the continuous variation, continuous development of form; it is the fusion of harmony and melody in favour of the production of properly rhythmic values, the pure act of the drawing of a diagonal across the vertical and the horizontal" (528).

When reading this I thought of Xenakis' composition *Metastaseis*⁴⁶. Particularly the beginning of the composition (see Image 8), in which violin glissandi screech into life, providing a perfect illustration, I believe, of what Deleuze and Guattari are suggesting in the above quote. Xenakis challenged our perceptions of music with his compositional approaches – so why couldn't a similar effect be applied to listening experiences in public urban spaces?

At first I tried to import pictures of sonograms into Metasynth's image-synth, but while this was an attractive idea, the reality was that it played back as a burst of white noise. Metasynth would read the whole picture, causing every pixel of the picture to generate a

⁴⁵ In fact these experimentations went beyond my PhD. It started to affect the sounds I was making in my *hiddensound's* performances. If the reader is interested the result of these experimentations can be heard in a live performance accessible at the following weblink <http://hiddensounds.bandcamp.com/track/live-racket-part1> (accessed 30/07/2014) between 7:50 - 11:00 minutes.

⁴⁶ The preliminary sketch for this composition was translated into the architecture of the Philip's Pavilion for the 1956 World's Fair in Brussels (LaBelle, 2006, p. 187). I want to stress that I am in no way suggesting that there is any connection between the work of Xenakis, and Deleuze and Guattari, only that I have drawn conceptual connections between Deleuze and Guattari's quote and Xenakis' sketch pictured in Image 8.

frequency. A more effective means of isolating the striations was importing a sound file into the top editing window, and performing a spectral analysis of the sound file, which reproduced the sound file as a spectrogram in the bottom *Image Synth* window. So in effect, rather than importing a sonogram, I could use Metasynth to generate a spectrogram of a sound file with which I could work. From my experimentation, three initial approaches to transforming striations with Metasynth emerged: Filtering, Harmonics and Modulations.

Filtering: The filtering technique, as depicted in Image 9, involves generating a spectrogram from a sound file, applying a colour to the entire window in Image Synth, then utilising the filtering function to generate lines where the striations exist. These “lines” can then be played back as a type of musical score, according to the instrument or sampler that is applied to the sound (Audio Sample 5).

Harmonics: The harmonic effect is a simple application of the “add harmonics” function, which enriches the sounds (Image 10). Generally I found this to be too overpowering. Adding this sound to existing site-conditions in testing scenarios seemed to be the layering of one noise source upon another, and was quickly abandoned. This effect works best when transforming sounds that already contain a musical harmonic structure.

Modulations: The modulation technique involved drawing free hand modulations around the striations and choosing an instrument suitable for playback (Image 11). Similar to the harmonics technique, it seemed to overly complicate existing site conditions as tested in the studio, and so was abandoned. However, as a stand-alone file, the sound remains interesting (Audio sample 6).

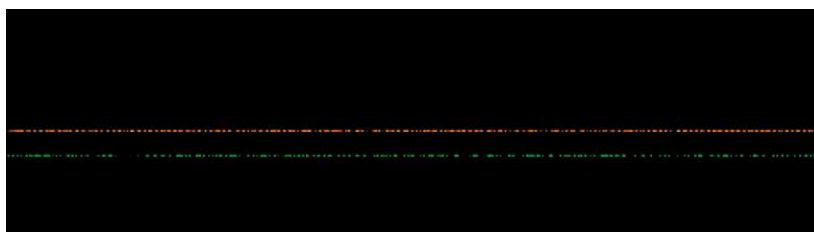


Image 9: Metasynth image of filtering effect upon two isolated striations

This is an example of the filtering effect, in which sounds are filtered so that only those that correspond with the striations can be heard. These two striations were the dominant broadband harmonics at approximately 300 and 400 Hz. Red and green colours relate to positioning within a stereo field, with red panned left and green panned right. Listen to Audio Sample 5.

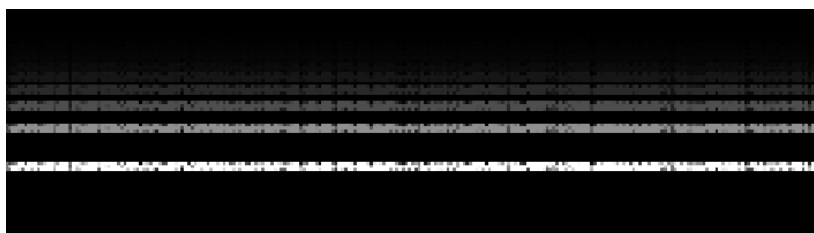


Image 10: Metasynth image of harmonics effect

The harmonics effect uses the filtering effect with the addition of harmonics. I quickly abandoned harmonics, as it sounded awkward and dominating. True to its name, this effect is best utilized with sounds that are already harmonic, rather than with urban sounds. The lowest striation is at 280 Hz. The white colour represents mono files.

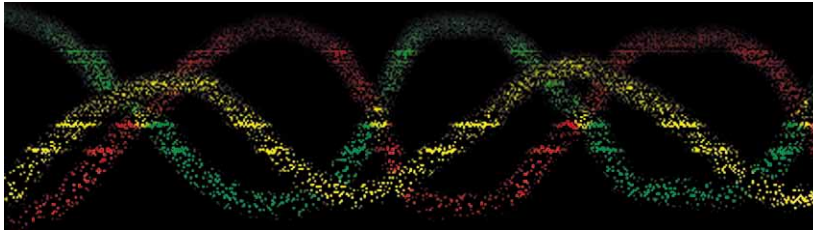


Image 11: Metasynth image of modulations oscillating around striations

Modulations are drawn around the isolated striations, causing a modulating pitch sound where the unchanging drones of striations typically exist. Listen to Audio Sample 6.

Audio Sample 5: Filtering effect (15s)

Two striations from the site-of-respite Manton Lane recording have been isolated from the spectrum analysis. A sound is coloured over the striations and filtered to produce this fluttering effect. See Image 9 for the visual representation generated in Metasynth.

Audio Sample 6: Modulation effect (34s)

The same two striations that have been isolated in Audio Sample 5 now have three separate modulations drawn around the striations. This is a stereo file – red is left, green is right and yellow is centre. See Image 11 for the visual representation generated in Metasynth.

Audio Sample 7: Filtering effect mixed with Manton Lane sounds (15s)

The filtered effect from Audio Sample 5 is combined with the original Manton Lane recording. This marks the beginning of explorations on the impact of adding processed sounds into public spaces by referencing the site-specific sounds of those spaces. Of all the experimentations, I believe this was the most successful in regard to its potential application to site-specific works.

None of these sounds actually made it into my subsequent projects. I found the technique created sounds that tended to layer noise upon noise. If this was the listening experience in a test situation, it seemed clear to me that these sounds would not be suitable in the real world. To be clear, testing occurred when I mixed a site recording and its transformed sound, as can be heard in Audio Sample 7.

I found the processed sounds to be better in isolation rather than mixed with their original unprocessed sound files; however, I would continue to use Metasynth in different ways, as will be explained. This period of experimenting with striations was instrumental in developing my design thinking around the transformation of urban sound(scape)s, and thus has been discussed in detail. This was an important step in exploring the imaginative notion of the city as expressing itself with vocalisations that departed from the typical hums and drones, as described by *The Striated Sound(scape)*, so as to diversify the city's sonic affects on its human inhabitants.

Project Research Outcomes: *Silencing Urban Exhalations*

Silencing Urban Exhalations confirmed that attentive listeners have awareness of, and appreciate, the subtraction of noise sources. However, it was evident that many people did not notice the exhaust outlet switching on or off. Add to this the long negotiations with bureaucratic power networks to achieve a shutdown, and noise subtraction presents itself as a complex design response with little (or at least only short term) perceivable benefit. The negotiations with bureaucratic networks developed into the first conceptual tool, *Radiating Striations of Centralities*, which recognises tensions that exist between creative applications to urban spaces and the negotiations required to appease centralised authorities in the realisation of sound(scape) designs. Viewing the recording in sonogram form, two phenomena became apparent. Firstly, noise is like a fog that blocks potentially emergent sound sources. Secondly, *The Striated Sound(scape)* is observable, and can be understood as a dominating spatial characteristic that, as conceptual tool for design, illuminates potential reimpartings of the smooth in striated space to diversify the homogenous Voice of the city.

3.2 Project 3: *Revoicing the Striated Sound(scape)*

Project Synopsis: *Revoicing the Striated Sound(scape)*

Revoicing the Striated Sound(scape) was a sound installation for the City of Melbourne Public Art Commission that ran from July to November 2012. Four speakers networked to a computer were encased inside readymade air-conditioning units. The speakers played eight distinct works, ranging from 5-15 minutes, composed of sounds synthesised from site-specific sound recordings. The sound material introduced was composed primarily in Metasynth, using *The Striated Sound(scape)* conceptual tool. Rather than removing noise, the works transformed existing noises: the air-conditioners were given diverse vocalisations.

Revoicing the Striated Sound(scape) was installed in an unnamed Melbourne laneway behind Little Latrobe Street, near the Swanston Street intersection, from August-November 2012, and was operative seven days a week from 10am to 10pm. While I was experimenting with *The Striated Sound(scape)* conceptual tool, which is discussed in the previous section, it came to my attention that the City of Melbourne Public Art Commission was looking for Expressions of Interest (EOI) for the creation of public artworks in the City of Melbourne. I saw this as a great opportunity to explore my emerging ideas in a public forum. And, I consider the act of applying for the commission as a direct application of the conceptual tool *Radiating Striations of Centralities*; I was going to receive the support of a central bureaucracy to realise my transformation of a peripheral striated space. My EOI was successful [see appendix 2], after which I proceeded to create my second PhD project, *Revoicing the Striated Sound(scape)*.

Related Works

The use of air-conditioning sounds to create sound-art works is a popular theme amongst sound-artists. In his 1977 work, *Times Square*, Max Neuhaus combined urban and introduced sounds by placing a

speaker beneath a ventilator grill in New York's Times Square; in his 1983 work *Time Piece*, sound (including air-conditioning sound) is both added and subtracted from the soundscape. Contemporary Australian artists exploring the theme include Philip Samartzis, who integrated typically hidden infrastructure sounds, including air-conditioning sounds, into the exhibition spaces of the Adelaide art gallery's *Parallel Collisions*⁴⁷ at the 2012 12th Adelaide Biennial of Australian Art. Nick Murray exploited the white noise characteristics of air-conditioning sounds to create his spatialised sound work *White Noise* for the 2013 RMIT Gallery Sound Bites City exhibition.⁴⁸ These works, along with my own approach, reflect a continuing fascination amongst sound artists with the ubiquitous noise source of air-conditioners and ventilation outlets.

47 See http://www.artgallery.sa.gov.au/agasa/home/Exhibitions/Adelaide_Biennial_2012/Philip_Samartzis.html (accessed 05/08/2014) for more information.

48 See <http://www.rmit.edu.au/rmitgallery/soundbitescity> (accessed 05/08/2014) for more information.

Discovering Urban Ecologies

My original application to the City of Melbourne suggested Rainbow Alley as a potential site for the realisation of the project *Revoicing the Striated Sound(scape)*. I had initially come across Rainbow Alley during my sites-of-respite work and was intrigued by its doorways opening onto fatal drops and staircases that led to brick walls, not to mention its abundance of air-conditioners, ventilation outlets and exhaust fans, as seen in Image 12.



Image 12: Rainbow Alley

A view of the southern (left) and western (right) boundaries of Rainbow Alley. Note the abundance of air-conditioners and rubbish bins, and the general deterioration of the site. The water tank provides a reference point for the image overlap.

In August 2011 I spent many hours – day and night – in this space listening, recording (see Image 13; listen to Audio Sample 8, Audio Sample 9 and Audio Sample 10) and note taking (see Images 14, 15 and 16). I completely immersed myself in the space, and came to understand its rhythms, particularities and eccentricities. It was a transformative experience. For me, the space was alive: I imagined that it was speaking to me. Consequently, rather than judging the space as a *lo-fi* soundscape to be maligned, I experienced it as an *affective ecology* – for I, at least, was being affected by my long exposure to its sonic character. Within this time of immersion, my relationship with space was shifting from an acoustic ecology outlook toward an appreciation of the affects of sonic ecologies. This is another pivotal point in my PhD (and practice), in which myself-as-musician and the city-as-music begin to interconnect as an ecological interrelationship, where the city plays me and I play it back.



Image 13: Recording in Rainbow Alley

I spent many hours recording the sounds of Rainbow Alley. In this photo I am using a Sanken shotgun microphone to record the multiplicitous details of individual air-conditioners.

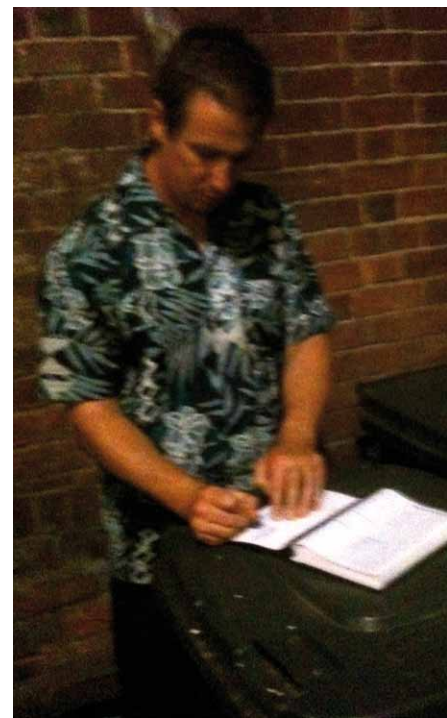


Image 14: Note taking in Rainbow Alley

During listening and recording periods I took extensive notes on the rhythms and particularities of the Rainbow Alley ecology. See Images 15 and 16 for more details.

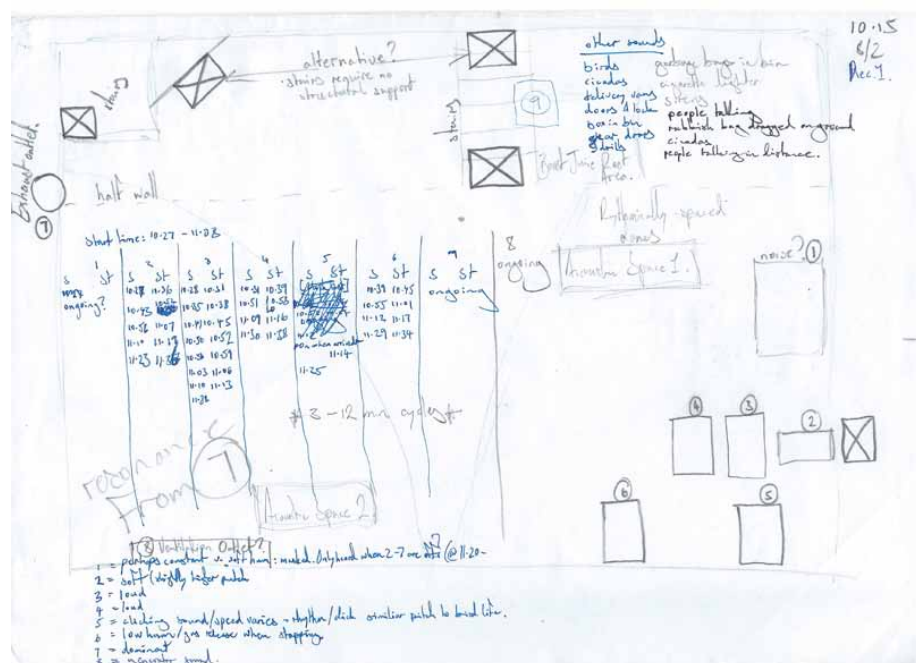


Image 15: Written notes recorded in Rainbow Alley (example)

Each rectangle represents an air-conditioner. The air-conditioners are labelled 1-8 (7 and 8 are, respectively, an exhaust outlet and a ventilation outlet), and a corresponding table records their start-up and switch-off times. The rectangles with crosses indicate potential placement of readymade air-conditioner units created for the installation. Other sounds in the site have been recorded in the top right of the picture, and a general reflection of the sound quality of each air-conditioner and ventilation outlet is recorded in the bottom left of the image.

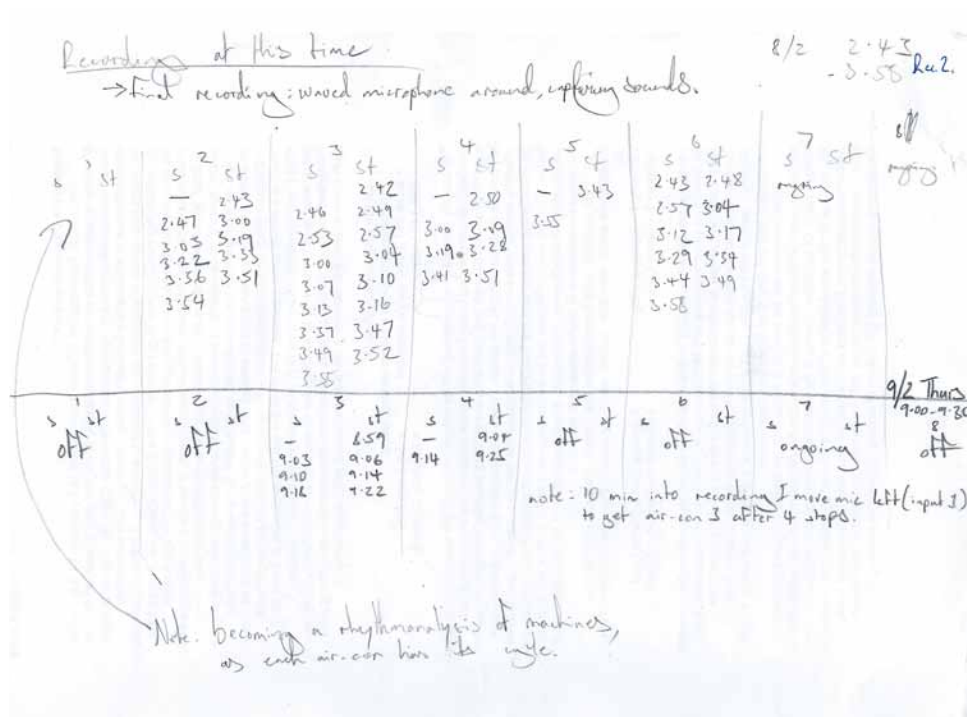


Image 16: Example of written notes recorded in Rainbow Alley

This image provides a clear view of the division of the eight sound sources and their start up and switch off times, over a 75-minute listening period. By this time I am intimate with the rhythms of the space, and the individual and collective sounds of different configurations of air-conditioners and ventilation outlets. Other sounds familiar to the site include rubbish bin movements, doors opening and closing, bird calls, tram bells, and a garage door opening and closing.

Audio Sample 8: Air-conditioners turning on (15s)

The sounds of three recordings of air-conditioners turning on are played sequentially. The air-conditioners are labelled respectively in image 15 as 3, 4 and 6. Note the subtle differences between each air-conditioner, with each one producing a different timbre as it switches on and roars in to life. I came to see each of these machines as having their own unique characteristics.

Audio Sample 9: Air-conditioners operating (26s)

An air-conditioner, exhaust outlet and ventilation outlet, labelled in image 15 respectively as 5, 7 and 8. Air-conditioner 5 possesses a unique rhythmic element that went on to inform one of the compositions in the installation, titled *mic_movement* (see below). The exhaust outlet and ventilation outlet had the strongest sonic presence in terms of the length of time they remained switched on, and their overall spatial dominance.

Audio Sample 10: Other Rainbow Alley sounds (1m 42s)

This sample orientates the listener within the sonic ecology of Rainbow Alley by providing an inventory of its existing sonic conditions. This sonic ecology is similar to many that I encountered in other laneways during the *Sites-of-Respite* report. In order, the sounds are: distant tram bells, approaching street cleaner, plane flying overhead, garage door opening, crows calling, sparrows chirping, moving bin, unidentified bell and door opening and closing.

Studio Tools

49 By this time I was placing exhaust outlets, ventilation outlets and air-conditioners under the same term, air-conditioners. I will continue to do this for the rest of the exegesis.

The sounds created for the installation were collected in Rainbow Alley with a Sanken shotgun microphone, a stereo pair of Rode NT5s and a Soundfield Ambisonic microphone, all recorded into Sound Devices 722 and 744T portable audio recorders. The files were transferred onto a Mac desktop at The Pod, the main working studio at SIAL Sound Studios at RMIT University, and onto another Mac desktop in my home studio. I worked between studios during the project. My working method involved working across a suite of software packages, typically opened simultaneously. These included Reaper, Audio Finder, Ableton Live, Metasynth and WasP.

Reaper

My first step was to download the field recordings into the Digital Audio Workstation, Reaper, and utilise the regions manager to extract the specific sounds that I wanted to work with. This process informed the types of compositions I eventually created, as I built the compositions based on the most common sound types that I identified in the site. By listening again to the field recordings, I identified that the most common sounds were air-conditioners⁴⁹ turning on and off, air-conditioners running continuously, doors opening and closing (typically office workers from adjoining buildings enjoying a cigarette), wheeled bins being moved along the ground, and bins being emptied or filled. There were of course many more sounds (see Image 17), but as these were the most frequent and commonly occurring, they tended to inform composition decisions.

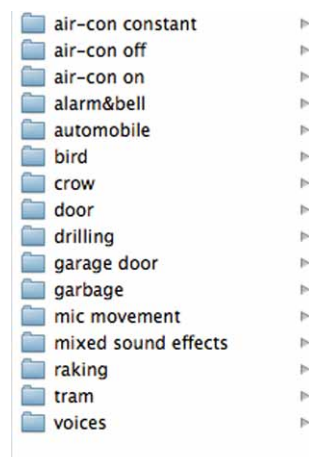


Image 17: List of sound types identified in Rainbow Alley

The list of sound types arrived at was a function of editing and categorising sound recordings from Rainbow Alley. The main sounds used in the compositions were 'air-con constant', 'air-con on', 'air-con off', 'door' and 'garbage'.

Metasynth

Having a suite of sounds to work with, I began extensive experimentations in Metasynth. In particular, I took advantage of the granular synthesis functions in the Effects window, including Grain, Shuffler and Stretch. I inserted a range of sounds into Image Synth's multisampler, and then used the drawing functions in the Image Synth window to apply various textures to existing sounds, particularly pitch-shifting. Metasynth's Spectrum window (see Image 18) has a formant filtering function (used in multiple compositions) that allowed recorded voices and air-conditioning sounds to be saved as formant filters. I

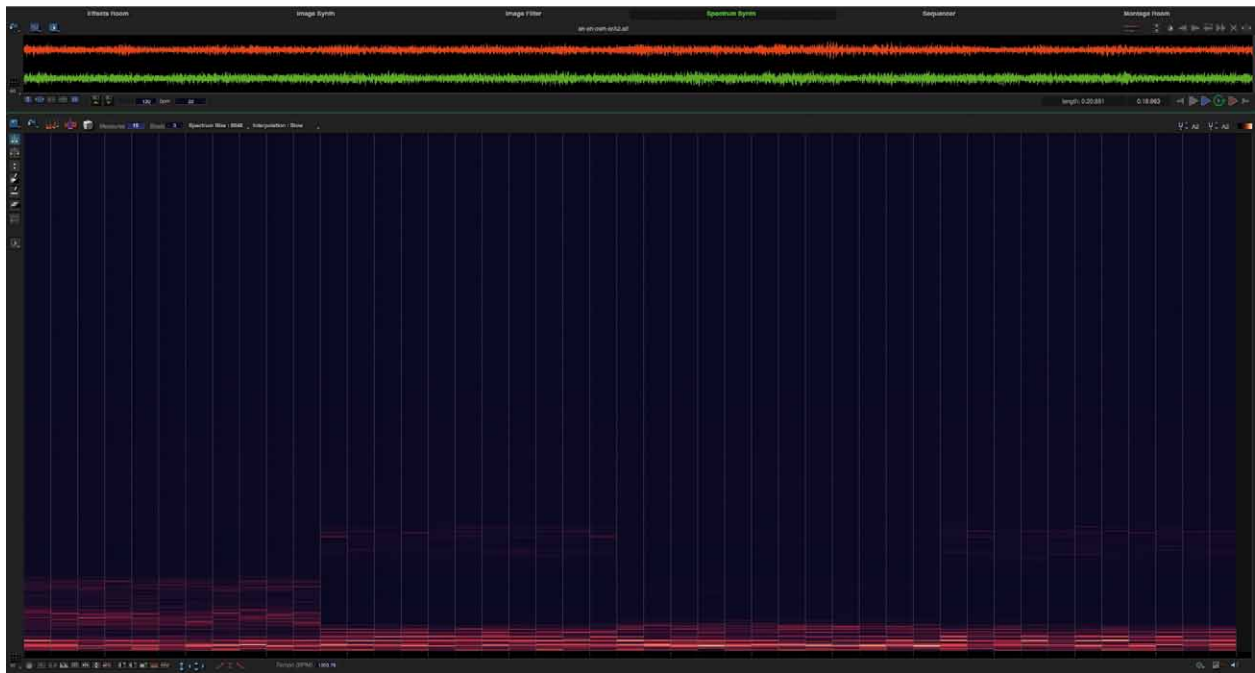


Image 18: Metasynth's spectrum window

The bottom window is a spectral analysis of the air-conditioning sound sample visible in the top window. Note the dominance in the lower frequencies of the air-conditioning sound. A formant filter can then be applied to the spectrum to create the sense of a speaking air-conditioner.

treated original recordings with the formant filters, thus transforming raw air-conditioning sounds into human formant forms and vice versa. This was successfully utilised to create humming and chanting air-conditioners. Furthermore, Spectrum's shuffle function allowed regions to be split and randomly rearranged both horizontally and vertically, which created various discombobulates of typical everyday sounds. In particular, I used this function to apply surreal treatments to human voices, as can be heard in the composition titled *Rhythm*.

Ableton Live and AudioFinder

A number of Ableton Live's effects were used for the compositions. Ableton Live's 'envelopes' were used to treat sounds of a longer duration, particularly continuous air-conditioning recordings of up to 10 minutes (see Image 19). The corpus VST Sub-Filter Boost, which adds a low-frequency bias, and Ableton Live's filters were used to create modulating effects and deep drones. Ableton Live was also used to record vocals of various people including members of my family and improvisation vocalist Awomadah Fig⁵⁰. Vocals were added to a number of compositions, and (as discussed above) were also treated in Metasynth's spectrum window. Audiofinder was another invaluable tool. I was working with a huge number of files and so the batch convert function for operations such as normalisation, fades, and renaming files was often used. This became particularly pertinent when producing files that could be effectively used by the Max/MSP patch, WasP.

WasP

The work required a delivery and playback system. SIAL Sound Studios had been working for a number of years on a multichannel

⁵⁰ I made the decision to add human voices for two reasons. Firstly, it was a play on the idea of *revoicing* an acoustic space. Secondly, I felt it would add some more engaging moments within the effectively machine-sound environment that I was creating.

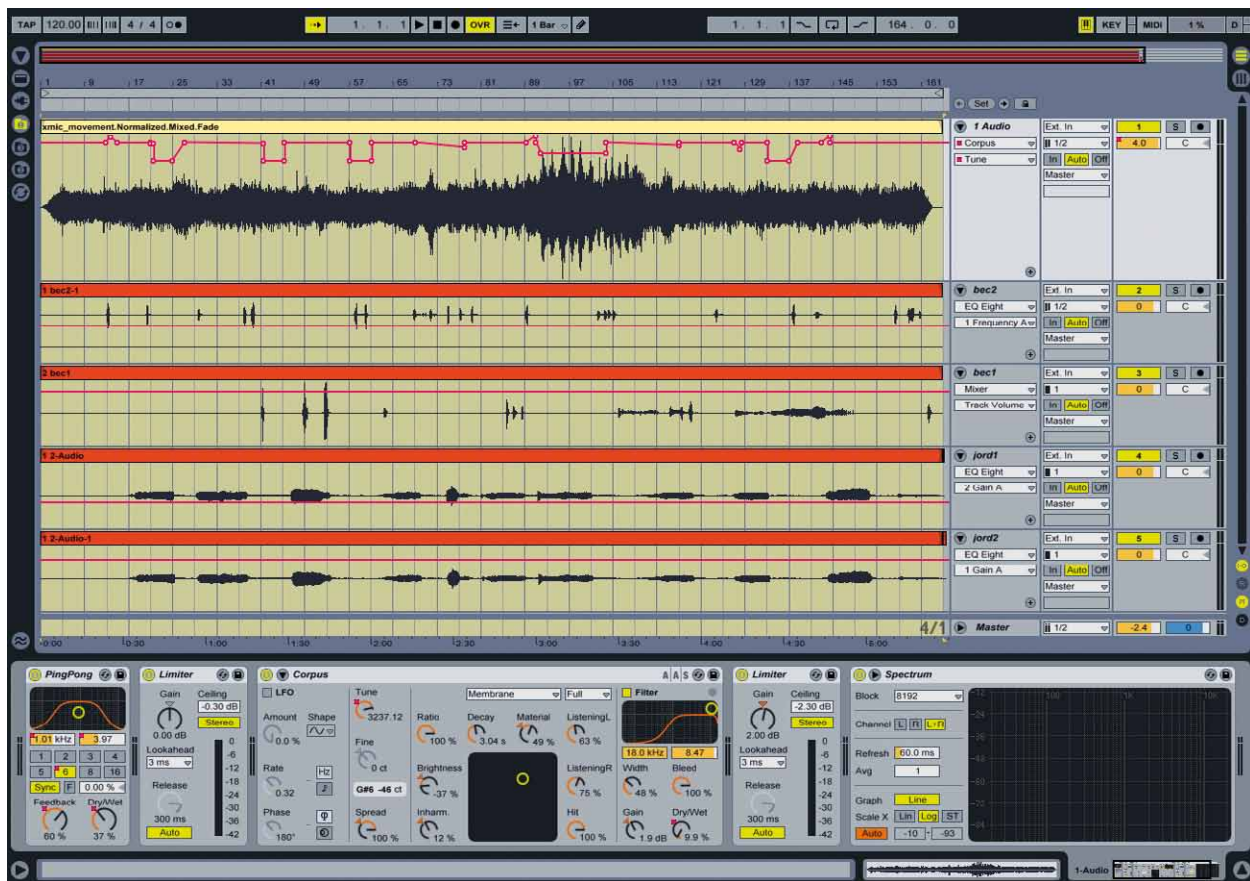


Image 19: Ableton Live (composition)

The top track is the sound of an air-conditioner and the bottom tracks are recorded vocals. Note the use of envelopes. In the bottom window are a number of VSTs, including the Corpus VST which adds a low-frequency bias.

51 See <http://www.rmit.edu.au/architecturedesign/sial/soundstudio/projects/wasp> for more information on WasP (accessed 20/05/2014).

52 Jeffery Hannam and I are planning on developing this discussion in a future paper.

composition and playback soundscape system called WasP⁵¹ (See Image 20). The program allows users to compose soundscape compositions and to playback these compositions over multi-speaker arrays via a computer. The program was still in a development stage while I was creating *Revoicing the Striated Sound(scape)*. My project allowed the program to be tested for the first time in the field.

I set about an intensive process with SIAL Sound Studio's Max programmer and production manager, Jeffrey Hannam, who built the program in Max/MSP, to develop the WasP program to a level commensurate with the installation's needs. This process was challenging for both of us, due to the amount of programming and testing that was required in a short amount of time. I will not be discussing the details of this process in the context of my PhD,⁵² however it is worth noting that the process provided me with a highly detailed understanding of what the program is able to achieve, and consequently I was able to use WasP to its full capacity in the realisation of my project.

WasP provided the edited sound files with a strong sense of sonic gesture as afforded by its primary function, Vector-Based Amplitude Panning (VBAP). This allowed me to spatialise the sounds. Sounds could be made to move around the space either as a multi-speaker pan, or as the stochastic emergence of fragments of sound within

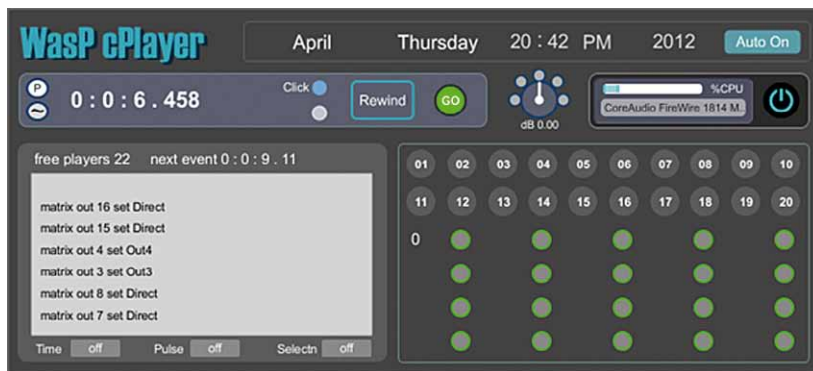


Image 20: WasP

WasP is a software environment created in Max/MSP. *Revoicing the Striated Sound(scape)* was the first project for which WasP was used in an outdoor environment. My research included a contribution to the development of WasP into a configuration commensurate with the installation requirements.



Image 21: Recording the installation

Four Rode NT5 microphones are embedded in windsocks, connected to a Sound Devices 744T portable audio recorder, which can be seen to the right of the image. Each microphone is directed towards one of the four speakers.

specific locations of the speaker array. Other functions afforded by WasP include pitch-shifting and multi-start times for individual files and group files. After I had edited the files to an acceptable standard, I used WasP to create the final compositions. WasP was also developed as a delivery system, which played back the eight compositions as a constantly rearranging 90-minute loop for the four-month period of the installation.

The Eight Compositions

Eight compositions were completed for the installation. Audio Samples 11- 20 are stereo renderings of a 4-channel recording of the installation recorded on the 15th August 2012 from 10-11.30 am. Each audio sample has the corresponding title of the original compositions, which are related to specific attributes of the original onsite sounds and/or certain effects that were aimed for in the compositions. This is

53 Every now and again someone would tell me they visited the site and heard nothing but air-conditioners. I suspect that they had encountered this piece.

described in greater detail in each of the captions that are attached to Audio Samples 12-21. Image 21 provides a view of the recording process, which included four Rode NT5 microphones arranged in a quad configuration, with one microphone pointing at each air-conditioner, and a sound devices 744T portable audio recorder. The following audio samples can only provide a sense of the sonic presence due to their stereo rendering, however Appendix 3 provides an uninterrupted 90-minute, 4-channel recording of the installation, which has been set up in Reaper.

Audio Sample 11: Normal Conditions (37s)

This is a daytime recording of the laneway sound(scape) (when the installation was inactive), which was measured on a sound level decibel meter at an average of 63-67dB. On average, the installation sounds added 3-6dB to the background sound level.

Audio Sample 12: aircon_on (1m 29s)

This piece includes unprocessed edits of recordings of air-conditioners switching on. The intention is to create the sensation of air-conditioners using their switch function to produce rhythms. The sounds are panned, creating movement across the four speakers. The panning disturbs the typical stability of air-conditioning sounds by providing the typically static sound with a sense of movement. Of all the pieces, this is most like the sounds of normal air-conditioners.⁵³

Audio Sample 13: aircon_cont (1m 28s)

This piece is similar to aircon_on, except that this composition accesses the continuous “in-between” sounds of air-conditioners. The installation sounds move through the space, again subverting the typical stability of air-conditioning sounds. Human voices are added that were transformed using formant filters in Metasynth; the intention is that these sounds emerge from the air-conditioners as a voice. There is an interesting counterpoint here between the low frequency sounds of the air-conditioners and the subtle high frequency calls of the sparrows.

Audio Sample 14: aircon_filter (1m 36s)

Using Ableton Live's Filter VST, I created displaced frequency sweeps between the four speakers to create a sense of movement. The resulting washing sound is suggestive of ocean waves. I added the whistling and cooing sounds of improvisational singer Awomadah Fig. These vocal sounds are mixed with the filtered air-conditioning sounds to create a sense of an emerging entity, which reflects the intention of the work to *revoice* the urban sound(scape). Note the crow call at 14s, which links nicely with the vocal sounds of the installation.

Audio Sample 15: aircon_modulation (1m 30s)

The air-conditioning sounds are treated to creatively mimic the variable environmental conditions of wind⁵⁴, and also to hint at the mythopoetic suggestion of a “voice in the wind”.⁵⁵ Two primary sounds make up the work. Firstly, a rhythmic sound pulsates around the perimeter of the space, which along with the existing air-conditioning sounds creates a maelstrom of sound. Secondly, a granulated sound, which is heavily spatialised, gives the impression of an entity diving in and out of the maelstrom.

54 Interestingly, I once took someone to the site that was unaware of the installation, and they thought the sounds were caused by wind entering the grills of the air-conditioners.

55 Murray Schafer discusses the mythopoetic significance of a “voice in the wind”. See Schafer, 1977, p.21-4.

Audio Sample 16: aircon_modulation with voice (20s)

I added a voice processed with Metasynth’s formant feature that was convolved with the air-conditioning sounds. The voice cries out “my city”, thus referencing the notion of an entity within the city, or the city itself speaking through the sound(scape) claiming the city as its own. The low loudness level of the voice in audio sample 16 is due to complaints from adjacent businesses. Due to the sensitivity of human hearing in this frequency range, it became clear that the use of the human voice was problematic. I had to greatly reduce the volume of the voice to alleviate the concerns of complainants.

Audio Sample 17: doors (1m 32s)

This piece is based on the sounds of doors opening and closing. The intention is that real-time doors will start opening and closing in the laneway and mix into the piece. I heard this happen a number of times, but unfortunately did not manage to record an example. Pitch-shifting provides a variation to the typical sounds of closing doors. This also affected air-conditioning sounds in the recording, producing a moaning sound. Note the sound of a trolley being dragged on the ground at 50s; its timbre is similar to that of the installation sounds.

Audio Sample 18: bins (1m 36s)

With the exception of slight pitch-shifting on a couple of files, there are no effects on the bins as there was so much textural variety in the original files. The piece sounds choppy due to stochastic panning of very short files. I attempted to counter this by adding some longer sound files of moving bins to give listeners a reference point to the sound source. Overall, I think the chopiness provides a suitable counterbalance to the other pieces that use longer sound files. The piece has a rhythmic element due to recordings of rubbish bins being wheeled on the ground, and the banging of rubbish bins on skips.

Audio Sample 19: rhythm (1m 36s)

This piece moves away from the theme of site-specificity. I introduced many new sounds, particularly human voices and air-conditioning sounds that were transformed beyond recognition. I moved away from the constraints of the theme of trying to make the air-conditioners sound like variations of air-conditioners, and instead explored sounds that were unlike those typically made by air-conditioning. I also provided the sounds with dramatic movement, which caused them to chop through the space. Although introduced voices are not included in this sample, I added the surreal voice of children by using the scramble function with a high attack interpolation in the spectrum synth. I added plenty of voices causing the laneway to talk to passers-by: *welcome to my alleyway, you are so beautiful, hello, do you like walking though my arteries, goodbye*. This was the piece that gained most attention, due to its extravagant sounds and gestures.

56 Spending so much time recording in public spaces, I was used to attracting the attention of authorities. In this instance a security guard appeared from nowhere as I danced through the space and waved my arms through the air catching the sonic particularities with my two mounted shotgun microphones. I took no notice of him, focused as I was. He looked truly perplexed, but eventually left me to my work.

57 The fact that the recordings of one laneway could so easily translate to a new laneway lends itself to substantiating the fourth conceptual tool, *The Isorhythmic Refrain* (discussed at length below), as both locations were homogenous in regard to their sound types, and their similar rhythms are suggestive of a consistent force shaping both soundscapes.

Audio Sample 20: mic_movement (1m 32s)

Originally I recorded these source sounds in Rainbow Alley by placing the microphone in my hand and dancing around the space.⁵⁶ I also pushed the microphone into nooks and crannies in and around the air-conditioners, collecting variations in reverberation, resonance and filtration. This sound recording was placed directly into Ableton and then transformed using resonators and delays. This piece contains the natural rhythm of air-conditioning unit 5 (see Image 15) that rattled in Rainbow Alley. I took advantage of this rattle with the resonator, so it can be heard as a kind of fast-paced, high-pitched rhythm. The piece also contains the deep chanting voice of a male, and a repeating female voice with significant processing for each repetition.

Relocating the Work

A few weeks before installation, the City of Melbourne became concerned that Rainbow Alley was an inappropriate site for the installation. As it was not a transitional space, they were concerned that few people would encounter the work. Also the space was isolated, smelly and contained the occasional observable needle from drug users. For me this was not a problem; in fact, transforming a site considered unsavoury was intriguing to me. However, political imperatives often prevail (and, as suggested by conceptual tool I must be contended with, while preserving the creative intention). A new site was found behind Little Latrobe Street, which can be seen in Image 26. At first I was concerned about the new location due to the site-specificity of the work; however, the sounds had little trouble translating from Rainbow Alley to the new site, as it was characterised by air-conditioning sounds, garbage bins and doors that opened onto the laneway.⁵⁷ Whether or not the installation would have sounded more embedded in Rainbow Alley is impossible to tell, as the work will probably never be experienced in this space. However, I think moving the work was appropriate, from the perspective of public exposure, as there was certainly high traffic in this location. People walking between Melbourne Central Railway station and RMIT University utilised the laneway, and there were also a number of local workers I encountered at the site who came regularly to experience the work. On the downside, the recorded air-conditioners in Rainbow Alley contained a different timbre to the air-conditioning stacks in the new location, which at times jeopardised the intention of interweaving and blending the sounds.

Project Installation

While working in Rainbow Alley, I was beginning to consider how I would deliver my edited sounds into the existing sonic ecology. My immediate idea was to conceal speakers within the space so that listeners would hear the sonic additions without necessarily seeing the speakers. During an on-site conversation with my supervisor, the idea emerged of fixing speakers inside air-conditioning units. The idea was immediately compelling as it combined the visual and the aural intentions, insofar as both the air-conditioners and the air-conditioning sounds would be experienced as belonging to the site, while in fact, they were constructed off-site for integration into the space. Air-conditioning shells were sourced from scrap-metal yards and reassembled with a pop-rivet gun and angle grinder. Bose FreeSpace DS 100 SE Loudspeakers were chosen due to their

environmental durability and excellent low-frequency response, which was essential considering the sound material consisted mostly of low frequencies. Images 22-27 act as a photostory for the assembly of the air-conditioning cases.



Image 22: Collecting air-conditioning casings

I visited half a dozen scrapyards while sourcing air-conditioning units. A surprisingly difficult task, as they are quickly molten for reuse.



Image 23: Reconditioning the air-conditioners

Reworking the air-conditioners was a cut-and-paste job using an angle-grinder and pop rivet gun. The aim was to cover as much of the surface as possible in vents to maximize sound emission.



Image 24: Air-conditioning unit with bracket

The final air-conditioning units were sprayed with paint, which concealed joints where parts had been pop-riveted together. The brackets were made of untreated metal, which quickly developed a rusted look, adding to the units' "used" look. The speaker plate was angled at 45 degrees. This added to the BOSE speakers' 90-degree swivel capacity providing excellent propagation angles for an elevated install.



Image 25: Speaker mounting

Four Bose Freespace DS 100SE speakers were mounted to the specially designed brackets. These speakers were selected as they have an excellent low-frequency response, essential considering the low-frequency sound material. Additionally, the speakers are specifically designed for outdoor use. Note the conduit, which housed the speaker wire. This was the only visual flaw in the work, as the conduit did not have a used look.



Image 26: The final installation

The four air-conditioning casings conceal the speakers, which are networked with speaker wires running through conduit to a computer system. The computer system is situated behind a door at the bottom right of the picture.

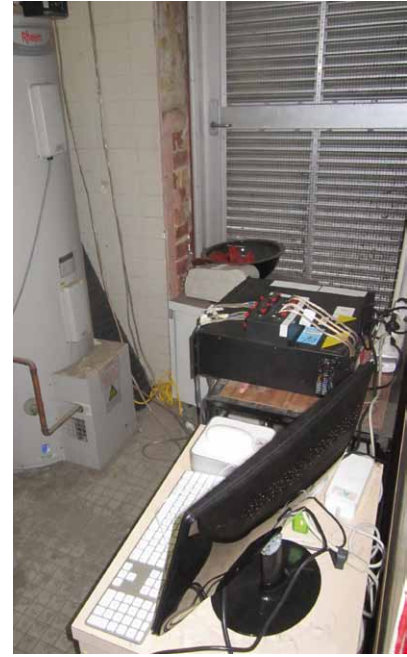


Image 27: The computer system

The computer system running WasP included a Mac mini and a Motu traveller external soundcard. An Ampeg amplifier, from which figure-8 cable was connected to the speakers through conduit adhered to the laneway walls, drove the four speakers. Note the speaker wires coming through the wall in the top left of the picture.

Project Findings

58 I collected material at each of the installation sites including on-site conversations, observations, interviews, video interviews and data collection in the form of questionnaires; however, I have decided not to pursue the ethnographic account of listener perceptions of the soundworks. Instead, I have decided to focus on the making of works, and related theoretical reflections for sound(scape) design. I intend to produce follow up documentation that will give a clear account of knowledge gleaned from the ethnographic accounts in future papers.

The installation ran for four months. I spent considerable amounts of time on the installation site during this time, listening to the sounds of the sound(scape) compositions merging with the site-specific urban sounds, and talking with people about their experiences; some who approached me, and some whom I invited. My original intention was to provide an ethnographic account of these experiences,⁵⁸ however, due to word limitations in this document, I have decided to explore this post-PhD, and instead concentrate in this exegesis on the making of the works. However, I will refer to some broad observations and certain conversations from my time immersed in the installation.

Designing for Night and Day

The differences between experiences of the installation at night and during the day were striking. The city is quieter at night, due simply to the reduction in traffic circulation, air-conditioner operation and human activity (in this part of the city). At night, the installation dominated the laneway's sound(scape). By day, when the background sound levels were more audible, the merging of installation sounds and urban sounds was more obvious. For example, on the 11th of November 2012 at 8pm the average background sound level measured over 5 minutes was 55dB, in comparison to the background sound level on the 14th November 2012 at 3 pm, which measured at 63dB when the air-conditioning stacks on the top of the building (see Image 28) were off, and 67dB when the stacks were on.



Image 28: Air-conditioning stack on rooftop

Air-conditioning stacks can be seen on rooftops on either side of the laneway. They were switched on during the day, which greatly increased the background ambient noise levels. At the bottom in the centre of the picture, one of the installed readymade air-conditioning units can be seen.

This equates to a maximum difference of 12dB (more than a doubling in perceived loudness), causing the experience of the installation to differ greatly between night and day. By night, the installation was a spectacle or performance; by day, a collaboration between the real and introduced in which new sounds were realised. A comparative example is provided in Audio Sample 21. I enjoyed the variation in listening experiences this provided; however, there is scope here for some addition of a delivery system that can be programmed to adjust its volume at different times so that the relative measurement between background city sounds and installation sounds remains constant. This may be desirable if a long-term sound installation is required that would not eventually risk dominating the night sound(scape).

Audio Sample 21: Installation comparative day and night recording (1m 25s)

This audio sample demonstrates the changes to the installation as the city ambience reduces from day to night. The first 42 seconds of this recording is aircon_cont by day. After a fade out, the file fades in as aircon_cont by night. Recording times are included in the final paragraph, page 44. The file provides a sense of how the installation becomes a stand-alone installation by night, and a collaborative, or resynthesising force by day.



Image 29: Laneway graffiti – Peril Paris

The western wall of the laneway contains a tag by famous Melbourne graffiti artists, Peril and Paris. This graffiti is never removed by the City of Melbourne. However, around the tag can be seen the customary grey paint that covers graffiti deemed undesirable by the City of Melbourne. Image © Carla Gottgens.

59 This is the case in a democracy such as Australia, at the very least. Perhaps the experience in totalitarian regimes would be different.

60 Entrainment is understood here as synchronising rhythms. The emergent graffiti began to take on a visual form, which was comparable to the sonic gestures and speaker configuration of the sound installation. For more discussion on entrainment see Clayton et. al. (2004).

Emergent Graffiti

The City of Melbourne has a strange relationship with the graffiti on the site. A tag in the site, titled *Peril Paris* is protected by the city (see Image 29) and has remained in-situ for many years, whereas any new graffiti that appears around the tag or on the opposite wall of the laneway is covered over with grey paint by the City of Melbourne. The graffiti on the opposite laneway wall (see Images 30 and 31) regularly alternates between the City of Melbourne's plain grey paint and the striking colours of graffiti art. These observations illustrate the tensions explored in the first conceptual tool, which manifests in the laneway as the struggle between centralised controls and peripheral emergences. This is suggestive of the incapacity of central bureaucracies to repress creative emergences⁵⁹ in the laneway, instead forming a rhythmic relationship with the periphery. Fascinatingly, the emergent graffiti forms began to entrain⁶⁰ with the installation sounds: a combining of peripheral emergences (visual graffiti and sonic installation) that each had their own differing relations to centralities; the visual being illegal and the sonic being commissioned.

Image 30 shows the graffiti on the Eastern wall (facing the wall pictured in Image 29), which emerged towards the final period of the installation. Note the profile of the face in the centre panel, in which the ear is facing outwards. This is in stark contrast to most graffiti wherein faces



Image 30: Sonic graffiti

This is the emergent graffiti towards the end of the installation. Note to the left the Kandinsky like splashes of colour. In the centre a face is orientated with its ear outwards, and four concentric circles provide a visualisation of the four sound sources of the installation. To the right a line drawn onto the ground, reminding me of the sonic gestures designed in the sounds.



Image 31: Post installation graffiti

Sadly, though unsurprisingly, the City of Melbourne covered the graffiti from Image 30 in grey paint, which was soon covered in new graffiti. Note the return to the typical forward facing faces. Even the profile of the skull has an emphasis on the eye, with a cone of vision protruding outwards.

face outward, which can be seen in Image 31: the same wall a couple of months after the installation ended. Note also in Image 30 the four concentric circles that overlap to create a central point, which is an apt visual representation of the interweaving sonic arrangement of the four speakers in the installation. And interestingly enough, is exactly the same as the sonic logo for the Soundfield ST350 Microphone, which I used for a number of recordings throughout my PhD. To the left of Image 30, note the splashes of abstract colours, reminiscent of Kandinsky's painting *Composition VIII*, one of Kandinsky's many paintings in which he captures music as visual form. Finally, to the right of Image 30, a line is drawn from the wall on to the cobblestone paving of the site, in a suitable visual representation of the spatialised sounds within the installation site. It is rare, at least in my experience, to find graffiti on the ground.

At one stage, while at the installation site, a man approached me asking if I was the artist. He was very positive about the work and also told me that he was a graffiti artist and that he could confirm that graffiti artists had indeed painted in response to the work. I was obviously both very happy and interested to hear this, but in my exuberance I did not ask for the man's email address, which unfortunately means I can't verify this encounter for the reader, except to confirm that the encounter was genuine. Observing the unfolding story of the

61 There are certainly some interesting psychological questions to be explored here in regard to site-specific noise design, unintentionally drawing listener attention to noises that are typically rendered obsolete by habituation.

graffiti demonstrated for me the power of sound to catalyse creative emergences, which in this case can be understood as both the graffiti and the creative responses of the graffiti artists. The result was the emergence of an increasingly diverse and exciting visual and sonic ecology. A deeper investigation between sound(scape) design and urban graffiti art is beyond the scope of this PhD, but it would be an interesting study to take up in a more systematic and rigorous way in the future.

Listener comments

There is much to say regarding the response of visitors and local office-dwellers to the work. As mentioned, the intention is to explore this in detail in post-PhD publications. However, I will touch on two points. The first is the disparity between the responses of those who visited the site and those in businesses adjacent to the site. On either side of the laneway are offices. Generally there were no complaints, although two offices were disturbed by the sounds of the installation, particularly the sounds of human voices. I spent considerable time with at least one of the office workers identifying the sounds that were causing disturbances and tweaking those sounds so that they were of a lower volume, or by employing notch filtering so that I could remove frequencies to which the human ear is most sensitive, particularly the range of 1-4kHz. This was a powerful advantage offered by using WasP as a composition and delivery system. Because it works exclusively from pools of files, individual files could be located (depending on the time of day the reportedly offensive sound was encountered), edited and then returned to the pool. This could only be deduced when I filled out a time sheet at the same time as an official from the City of Melbourne, who was in the complainant's office. I would record the start and end time of each composition, while the official would record complaint times. Matching the documents allowed me to isolate the offending files. However, the process became rather farcical when it became clear that the office inhabitants were complaining about noises (including human voices) that were not part of the installation. As the installation transforms site-specific sounds, the inhabitants were hearing non-installation sounds and complaining that these were the sounds of the installation causing them irritation. Perhaps it could be argued this is an unintended issue with site-specific works that reference site-specific sounds.⁶¹ Visitors, by contrast, were unanimously positive about the work. I met the occasional office or hospitality worker who visited the site regularly to experience the sounds. There were a range of responses, but in general there was little doubt that imaginations were piqued and curiosity was invigorated. I also found this to be the case with people I invited to experience the installation with me. I have little doubt that there are many who would like to find installations like this on a regular basis throughout their city journeys. One young man I encountered told me he came to the site regularly to just sit and listen, both alone and with friends, which brings me to my second point. It was at this stage that I began to consider the possibility that I had created an alternative version of a site-of-respite. This initial thought becomes fully recognized by the completion of project six, which is discussed in detail below. Future research will include the exploration of the possibility of installing a network of sound installations to act as spaces of curiosity and imaginative engagement; lessons learnt from the complaints will be employed to produce spaces that provide maximum affects, and minimum disturbance.

3.3 Conceptual Tool III: *Repatterning the Urban Sound(scape)*

From the project *Revoicing the Striated Sound(scape)* emerged the third conceptual tool, *Repatterning the Urban Sound(scape)*, which is both a conceptual tool and a methodology. It is a conceptual tool insofar as the urban sound designer can apply it to understand urban sound(scape)s as fixed configurations of sound objects that comprise the *Voice* of the city; and as a methodology, insofar as the conceptual tool can be understood as a number of discrete steps which can be employed by the urban sound designer to transform urban sound(scape)s. These include: spatial analysis, sound recordings, the transformation of sounds and the reintroduction of transformed sounds to mix with their original referents. The potential of this conceptual tool to act as a working methodology is realised in the creation of Project 5: *Subterranean Voices*, discussed at length below.

From mythopoetics to structuralism

An interesting outcome of *Revoicing the Striated Sound(scape)* is that although I started the project with mythopoetic considerations of the *Voice* of the urban sound(scape), the project became the realisation of a structural-linguistics methodology that I would later apply to Project 5: *Subterranean Voices*. The mythopoetic approach arose from my discovery of *The Striated Sound(scape)*, which I considered to be the homogenous drone, and ubiquitous *Voice*, of the city Leviathan. My response to this discovery was to record the city's *Voice* and identify its various utterances, which I consider to be the sound objects⁶² that constitute a given sound(scape). These utterances were transformed in the studio and reintroduced into the urban sound(scape), which acted to *revoice* the sound(scape). As a result, I had produced a structural-linguistics approach: I had sampled the city's *Voice*, broken it down into its individual utterances to create new phonetics which were in turn reintroduced into the original site to produce new vocalisations. This approach resonates with CRESSON's structural-linguistics description of the relationship between soundscapes, sound effects and sound objects. CRESSON's approach to understanding and describing urban sounds is a mixture of phenomenology and structuralism: most of their sound effects are based on human-centred phenomenological perceptions of urban sounds⁶³, while their collection of sound effects can be considered a catalogue of effects with which the urban soundscape is structured⁶⁴. However, in the case of conceptual tool III, a specific structural-linguistics analogy discussed by CRESSON has been employed. CRESSON describe the city as composed of sound objects (utterances), which combine with the built environment and/or phenomenological perception to produce sound effects (sentences), which make up the soundscape (book) (Augoyard and Torgue, 2005, p.7). In *Revoicing the Striated Sound(scape)*, I had collected utterances (sound objects) to rewrite the book (my emergent sound(scape)s) with multiple vocalisations.

I came to apply this structuralist-linguistics analogy to a reflection by R. Murray Schafer in his book, *Voices of Tyranny, Temples of Silence*, in which a highly critical account of the urban, in favour of the "natural", is presented. He writes that "the basis of all soundscape

62 There is debate in the sound community surrounding whether a sound should be considered an object or an event. For example, see Cox (2014) and DiScipio (2014). This is discussed in the introduction and will be pursued in greater detail in Chapter 6. However, in the context of this methodology I find the concept to be useful. Particularly as I am working with sounds that have been filed, by name, on a computer to be accessed for future playback by DAW's and sound-producing software. It might be speculated that a sound is an object when stored as a digital artifact and an event when played. DiScipio suggests something to this effect in his paper 'Sound Object? Sound Event! Ideologies of Sound and the Biopolitics of Music' printed in the *Soundscape* journal (DiScipio, 2014).

63 For example *anamnesis* is a phenomenological sound effect, which is described as "the often involuntary revival of memory caused by listening and the evocative power of sounds" (Augoyard and Torgue, 2005, p.21). The anamnesis effect is integral to a discussed soundscape design approach in a paper I wrote for the *buildings* journal titled 'Site-Specific Soundscape Designs for the Emergence of Sonic Architectures and the Emergent Voices of Buildings' (Lacey, 2014).

64 Bjorn Hellström describes CRESSON's approach to urban sound design as structural (Hellström, 2003, p.21).

65 This idea is developed fully in conceptual tool IV: *The Isorhythmic Refrain*.

design ought to be to develop the *artful patterning* of what is already there” (Schafer, 1993, p.103, my emphasis) and that “refrigerators, vacuum cleaners and air-conditioners perform services originally provided by nature, and we might try to *endow them with sounds* reflecting this fact” (p.111, my emphasis). It occurred to me that this is exactly what I was doing with the installation *Revoicing the Striated Sound(scape)*. I was transforming the sound(scape) by mixing real and synthesised sound objects, thus creating new configurations of familiar sonic patterns that are encountered in the laneway. I was altering familiar patterns of sounds so that they reflected the diverse manifestations of patterns in “nature”, that is, patterns that shifted on a day-to-day basis rather than being repetitively produced, as they are in the urban. However, rather than *artfully pattern*, which implies that there is no pre-existing pattern (or at least any pattern that might be deemed artful), and thus risks judging the urban as lacking aesthetic value (which, considering Schafer’s belief in *lo-fi* soundscapes, is probably the case), I have applied the prefix *re-*. In so doing, I reorientate Schafer’s concern towards the idea that *patterns of urban sounds are fixed*, and away from his (perhaps unintended) presumption that there is no pre-existing pattern. By this I mean that rather than supposedly artfully patterning, for example, air-conditioning sounds, I have simply repatterned their existing sounds. By repatterning the air-conditioners’ fixed sonic patterns, *Revoicing the Striated Sound(scape)* applied the variations in sound that one may experience in “nature”; for example, the constant drone of an air-conditioner is transformed into the unpredictability of wind gusts (as heard in Audio Sample 14 and Audio Sample 15), or the mythopoetic encounter of hearing a *voice in the wind* (as heard in Audio Sample 13 and Audio Sample 15). This removes Schafer’s judgemental countenance in his descriptions of the desired act of soundscape design. Instead it reshapes his soundscape design reflections into an approach that intertwines introduced sounds with existing sonic ecologies to create more diversely affective sonic ecologies; unlike the limited affects produced by the striated sound(scape), which is a fixed and repetitive pattern that homogenises human experience.

The joy of “nature”, as I see it, is that a sonic pattern is never entirely fixed, there is always some kind of variation; however, the urban tends towards fixed patterns, where repetitive motifs risk reducing experience to banal repetition.⁶⁵ It is the constant repatterning of existing patterns, which affect diverse, creative and smooth (insofar as the striations within the sound(scape) are constantly reshaping into new and unpredictable encounters) spatial configurations and human experiences. By repatterning urban sound(scape)s the *Voice* of the city is continuously expressing its presence with multiplicities of emergent vocalisations, rather than the repetitively homogenous *Voice* of the striated sound(scape) that risks banalising urban experience.

Applications of Repatterning the Urban Sound(scape)

Repatterning the Urban Sound(scape) is both a practical methodology and a conceptual tool that emerged from the project *Revoicing the Striated Sound(scape)*. It has provided three significant outcomes for the PhD. Firstly, I wrote about this conceptual tool in the paper “Designing Urban Soundscapes for the Effects of Nature”, which was

presented at the *Balance-Unbalance Future Nature: Future Culture(s)* conference in Noosa, Queensland in May, 2013 that has since been published as a book chapter (see Lacey, 2013). Secondly, conceptual tool III became an important precursor to the development of conceptual tool IV: *The Isorhythmic Refrain*, which is discussed below. Thirdly, as a methodology, the conceptual tool is fully realised as a working method in the project *Subterranean Voices*, which is an evolved iteration of the approach developed in *Revoicing the Striated Sound(scape)*.

Project Research Outcomes: *Revoicing the Striated Sound(scape)*

Revoicing the Striated Sound(scape) demonstrated that there was an alternative response to the subtraction of noise when designing urban sound(scape)s. By recording site-specific sounds and reintroducing them into the site, a sonic ecology was created in which the addition of synthesised sounds, when combined with their original referent sounds, created subtle shifts in familiar, everyday experiences, which piqued the **curiosity** of people transitioning through or visiting the site. I called this emerging method of sound(scape) design *Repatterning the Urban Sound(scape)*, which has the objective of creating diversity within the homogenous sonic arrangements of urban spaces.

4 Bifurcation: discovering the “Passion Machine”

4.1 Project 4: *Intimate Footsteps*

Project Synopsis: *Intimate Footsteps*

Intimate Footsteps was part of the Design Research Institute's 2013 Convergence exhibition at the RMIT University Design Hub. It was conceived as a trial run for a public sound installation and was exhibited on the 4th and 5th of May, 2013. An 'interactive' chair was located in the centre of a narrow walkway on the ground floor of the Design Hub. The chair was surrounded by a cube configuration of eight speakers and two parallel lines of speakers, three for each line, on either side of the chair. When a person sat on the chair, two pairs of footsteps, one from either direction, were heard to walk towards the chair. Once those footsteps 'reached' the chair, the listener had the option of triggering intimate sounds, which emanated from the cube configuration.

A Bifurcation: searching for a Rhythmanalysis approach

Intimate footsteps⁶⁶ was a trial run for a public sound installation, which was realised as part of the RMIT University's Design Research Institute's Convergence exhibition at the Design Hub from 11.00am-1.00pm on the 4th and 3.00-5.00 pm on the 5th of May, 2013. The final project was very different from the initial intentions of the project, which began with an interest in Lefebvre's Rhythmanalysis (as represented in Figure 2 by the point of bifurcation from the narrative arc of the PhD) and ended with the creation of a “Passion Machine” to combat the effects of alienation in urban spaces (see Image 45). The moment when this project began was triggered by my fascination with Henri Lefebvre's *Rhythmanalysis*; particularly, that the city could be understood as a balance between linear and cyclical rhythms,⁶⁷ and also Lefebvre's contention that a rhythmanalysis was to be completed by a spatial practitioner.⁶⁸

I started out trying to create a system based on Lefebvre's rhythmanalysis [see appendix 4]. I tested it by sitting in a public space at RMIT University while following prompts suggested by Lefebvre, which I had developed into a tool for spatial analysis (see Image 32). I sat at a high vantage point⁶⁹ attempting to extract the rhythms of space, which I hoped would eventually inform a creative work. My attempt to understand rhythms as some kind of concrete entity was abandoned as I realised I was trying to discover rhythms as something independent of space. I was attempting to produce a

66 *Intimate Footsteps* was originally called *Curious Footsteps*. *Curious* was replaced with *Intimate* when (after the installation) I realised I had inadvertently created a “Passion Machine”. A weblink to the exhibition can be found at <http://www.designresearch.rmit.edu.au/events/convergence-curious-footsteps> (accessed 25/05/2014).

67 See Lefebvre, 2004. p. 90. Cyclical and linear time is explored at length below in the fourth conceptual tool, the *Isorhythmic Refrain*.

68 “Is a system of knowledge - a science - of the use of space likely to evolve...? Perhaps - but it would have to involve an analysis of rhythms, and an effective critique of representative and normative spaces. Might such a knowledge legitimately be given a name - that of 'spatial analysis', for example?” (Lefebvre, 1991 p. 356).

69 “(I)t is therefore necessary to situate oneself simultaneously inside and outside. A balcony does the job admirably” (Lefebvre, 2004, p.27).

RHYTHMANALYSIS: a distillation of Lefebvre's approach

⇒An analysis of repetition/patterns of sounds in the soundscape.

⇒Technique for understanding flows, gestures and sound patterns of people in space.

⇒Developing a tool for soundscape design – inducing positive affects in human behaviour.

Defining rhythmanalysis:

1. Identifying the convolution of cyclical (natural) and linear (mechanical) time.
2. Rhythmanalysis is an understanding of the everyday, the quotidian, and the relationship of the everyday with social space.
3. A rhythmanalyst is all ears; hear the soundscape the city plays and understand its composition.
4. Searching for diversity, as 'diversity always retaliates' against homogeneity.
5. Rhythms occur in all things from particles to galaxies.

Preparatory Exercise: (becoming a metronome for sound entrainment)

1. Close your eyes; listen to the rhythm of your heart beat; listen to the motion of your breath;
2. Conceptualise the organs of the body working, multiple rhythms in unison (eurythmia);
3. Sense the body as a kind of metronome that measures the rhythms of the city;
4. Listen to the city; let the rhythms reveal themselves.

Image 32: Field instructions for a Rhythmanalysis

This is an excerpt for the rhythmanalysis method I created based on Lefebvre's approach. This opening section outlines the preparatory exercises during which the spatial practitioner should prepare their own body, before undertaking the rhythmanalysis. For the full document see appendix 4.

70 In fact, Lefebvre himself makes this connection: "The living – polyrhythmic – body is composed of diverse rhythms... in a doubtless metastable equilibrium... How? By a simple mechanism? By homeostasis, as in cybernetics?" (Lefebvre, 2004, p. 80).

71 There are wide ranging practices and groups that have been inspired by Lefebvre's rhythmanalysis. For example see the rhythmanalysis lab in New York. See: <http://eyebeam.org/projects/the-rhythmanalysis-lab> (accessed 30/07/2014) for more details.

72 In fact, the exercise was titled Rhythms and Striations. I was thinking about them as a kind of compositional counterpoint. Though it is the Rhythms aspect that came to influence this project.

scientific account that ignored the poetry of space: its interweaving and interconnection, including with and through me, the observer. As Lefebvre warned, a rhythmanalysis has "...a transdisciplinary character. It gives itself the objective, amongst others, of separating as little as possible the scientific from the poetic" (Lefebvre, 2004, p.87). Similarly, my practice is not an attempt to create a quasi-scientific approach to understanding the everyday, but is concerned with the installation of sound(scape) designs that transform the everyday.

Although I abandoned this approach, there are two important outcomes to be mentioned. Firstly I perceived the 2nd order of cybernetics considerations implied in a rhythmanalysis⁷⁰: that the observer affects the observed network just as the network affects the observer; a network (or as I would come to call it, an ecology) should be understood as a complex dynamic of interacting rhythms with which the affected observer is interlinked. This thinking contributes to an emerging ecological perception of how I, as a practitioner, connect with the spaces with which I am engaged. Secondly, the experience provides me with initial experiential material for the development of conceptual tool IV: *The Isorhythmic Refrain*, which is discussed below, as a way to understand the temporal dimensions of everyday life.

Creating a Rhythmanalysis Sound Installation

I initiated an approach to rhythmanalysis that was more conducive to my practice.⁷¹ Taking a Soundfield microphone and a Sound Devices 744T portable audio recorder, I spent a day walking around the city collecting rhythms.⁷² Audio Sample 22 is a collection of the rhythms I found on that day.



Image 33: Collins at 5pm

An iconic image of the quotidian by Australian artist John Brack, painted in 1955. The footsteps of the city are presumably less homogenous in the present, with an increasing variety of footwear and gaits associated with multiculturalism and popular sub-cultures. Nevertheless, the linear is apparent in the directionality of striated streets and the demands of punctuality.

Audio Sample 22: Rhythm recordings (2m 00s)

This audio sample provides an inventory of rhythms encountered during a recording session in the Melbourne CBD. Rhythm sounds encountered in the recordings include a basketball game, a barista at work, an idling truck engine (close listening reveals a triplet like rhythm within the idling engine), a pedestrian crossing signal, a tram crossing track overlays, and finally, a combination of hammer blows and a reversing truck. What is notable about all these recordings is the absence of the sounds of footsteps, although during the recordings I observed people walking past me. With the exception of the occasional pair of high heels, footstep sounds are rarely heard in the city. Humans tend to be aurally absent, an observation that affected the final outcome of this project, which sought to reintroduce the sounds of footsteps, and ultimately, passion, into the urban environment.

I decided to focus on footsteps. Footsteps are clearly rhythmic, but they are also human. This was in stark contrast to the exclusively mechanical sounds I had dealt with in my previous projects. I perceived footsteps to be locked in a linear pattern, as informed by *The Isorhythmic Refrain* (discussed below), which repeated, more or less, the same pattern each day⁷³: the quotidian march from home to work and back again. This image is well captured by John Brack's 1955 Melbourne-based painting *Collins at 5pm* (see Image 33), which became a metonymic device when describing the work. Since the time of this painting, the gaits and trodden paths of Melbourne's inhabitants have certainly diversified, which is a function of multiculturalism and the rise of diverse subcultures; nevertheless, a similar pattern can be observed in the present, particularly at peak hour.

⁷³ Augoyard and Torgue (2005) refer to the footsteps of rush/peak hour as an example of "sonic homogeneity that favours the metamorphosis effect" (p. 76). The metamorphosis sound effect is defined as "the unstable and changing relations between elements of a sound ensemble" (p. 73). Although this description does not evoke the idea of linear rhythms, one could imagine each individual's footsteps as a linear refrain, that in combination create a metamorphosis effect, itself a type of sonic mass that suggests the daily rhythms of social organisation.



Image 34: A Vortex

Deleuze and Guattari use the vortex as a device to describe how the nomad can occupy all spaces simultaneously. An event can actualise anywhere within the turbulence of a vortex, as opposed to the predictable emergences of striated space.



Image 35: Howey Place

I discovered Howey Place while completing the Rhythm recordings. The space is extremely well-suited to hosting a sound(scape) design based on footsteps: an excellent combination of enclosure, public access and transitional environment.

74 "The model is a vortical one; it operates in an open space throughout which thing-flows are distributed, rather than plotting out a closed space for linear and solid things. It is the difference between a smooth (vectorial, projective or topological) space and a striated (metric) space: in the first case space is occupied without being counted, while in the second case space is counted in order to be occupied (Deleuze and Guattari, 1997, p.399)."

As discussed in the opening paragraph to the first conceptual tool (see section 2.3) the connection between the ideas of Lefebvre, and Deleuze and Guattari has remained a constant theme throughout my PhD. In this instance I considered Deleuze and Guattari's Vortex⁷⁴ (see Image 34) in relation to people's movements and gestures in smooth space. Deleuze and Guattari use the Vortex as an analogy for the movement of nomads in smooth space, who can be situated at any point in space and at any point in time; the point being, as I understand it, that a nomad's route is not dictated by the controlled flows of striated space, but unfolds in the moment dependent on the configuration of materials, and imaginative interrelationships, within smooth space. I wanted to create a sound(scape) design that would recreate the multiple paths of nomads in urban spaces, spaces I perceived to be dominated by *The Isorhythmic Refrain* (discussed in detail below).

While completing my Rhythm recordings, I came across a Melbourne laneway called Howey Place (see Image 35). Howey Place fascinated me because it is an enclosed laneway, while remaining open public space. It is used solely as a transitional space. Its enclosure creates a reverberant quality that emphasises the sound of footsteps, which are the dominant, and often exclusive sound source in the space. I imagined an artwork in which I would wrap the entire space in speakers; those transitioning would trigger an installation in which a varying number of footsteps would be heard to walk through the space, but in a vortex pattern: spiralling footsteps that wrapped themselves around the listener – walking along the walls, floor and roof. This would be my rhythmanalysis, a mobile inhabitant of striated space, triggering the virtual footsteps of nomads in smooth space.

The idea, as I was soon to find out, while poetically invigorating, was technically unfeasible. The initial spark, through technological necessity, became a very different project. A clashing of ideals and technical realities, that eventually led to the creation of the “Passion Machine”.

Creating the Project: a Collaborative Sound Design Approach

The sound(scape) design *Intimate Footsteps* was a collaborative effort. I realised that to achieve what I wanted, I required practitioners with technical expertise that I did not have. With the support of my supervisors I successfully applied for funding from the RMIT-based Design Research Institute. Although my intention was for the project to be realised in a public space (similarly to the previous two projects), I felt that a testing phase in an indoor environment would attenuate the complexities of working in public space, allowing me to concentrate on developing the required technology to the point where my ambitions could be realised. I used this funding to contract Max programming & sonic interaction design consultant Steve Adams,⁷⁵ while Frank Feltham, an industrial designer completing his PhD on human movement and technology, added the interaction element. My primary supervisor, Lawrence Harvey, provided compositional advice. My primary role was as conceptualiser, sound designer and project leader.

Sourcing footstep sounds

This project was a departure from my earlier approach of recording and reintroducing onsite sounds. As the work was to be realised indoors, as a test phase, I decided it would be easier to collect footstep sounds recorded by Foley artists rather than producing my own. The company Soundfirm⁷⁶ kindly provided me with a range of Foley sounds that had been recorded for a number of Australian movies and TV programs. I organised sound types into different folders, which can be seen in Image 36. After many hours of sorting through the material, top and tailing files, and testing with various versions of the delivery system, I eventually decided upon seven footstep sounds (listed in Image 36) with associated scuff sounds. I did not have scuff sounds to match all footstep sounds, so I created some scuffs from the footsteps files by editing out the initial transient of the footfall. This was not entirely successful; however, I resolved that I would record real footsteps in situ should I have the opportunity to realise the project in Howey Place, post-PhD. I also extracted material pats, in particular open hands rubbing and hitting surfaces such as leather, and kisses, from the collection of sounds I had been given, which can also be seen in Image 36.

Designing the delivery system

While working with the sounds I had collected from Soundfirm, I was meeting regularly with Steve Adams. I had had minimal encounters with Max/MSP up to this point,⁷⁷ and at times we had difficulty communicating ideas. Steve Adams had to translate my poetic flourishes and visions into a strictly defined Max/MSP language, which can't have been easy for him – though as he is also a working artist, I think he was more well-suited to interpreting my approach than a software engineer might have been. I had to become more specific

75 For more information on Steve Adams' work see <http://steliosadam.wordpress.com> (accessed 30/07/2014).

76 For more information on Soundfirm, please see <http://www.soundfirm.com/> (accessed 30/07/2014).

77 I don't include WasP in this comment. With its locked user interface, which does not require Max/MSP, or Max/MSP Runtime, to function, I consider WasP to be more akin to a stand-alone and ready-to-use program with its own set of instructions for use. Alternatively, *Intimate Footsteps* was a project-specific patch.

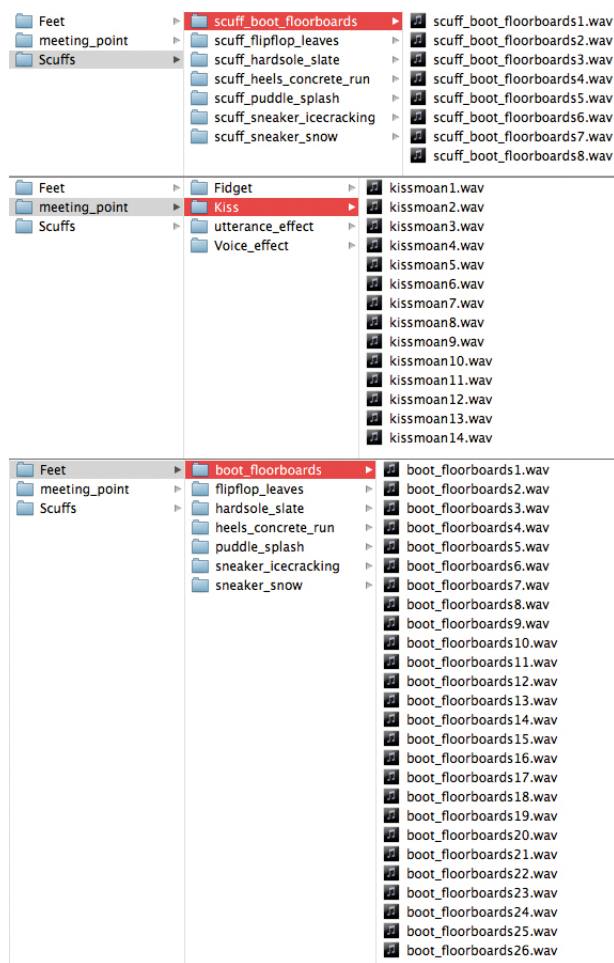


Image 36: Intimate Footsteps sound types

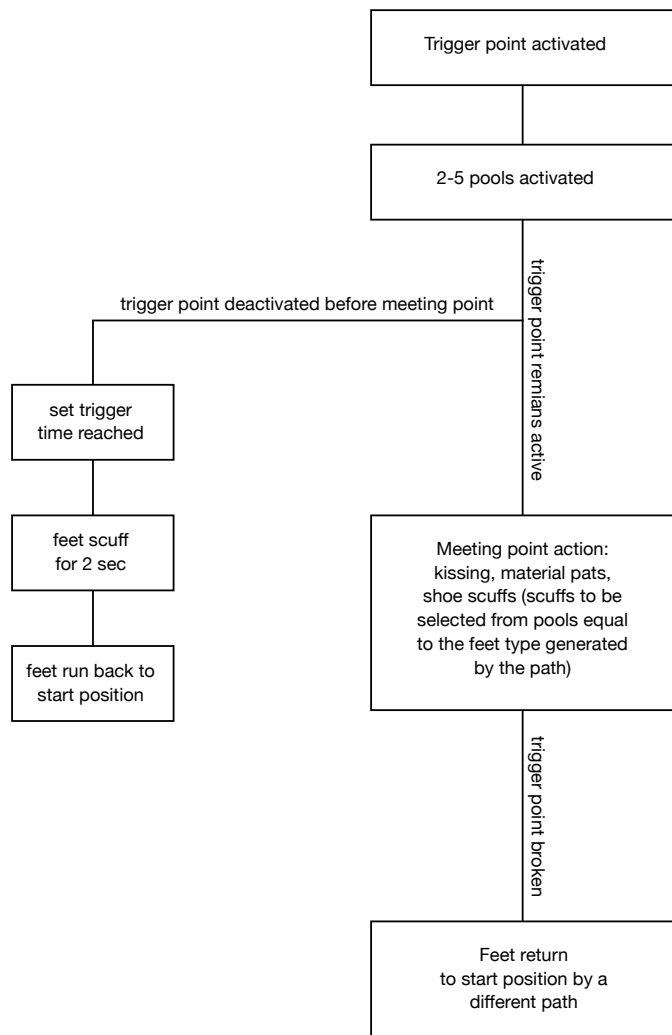
These were the final files selected for the installation. Note in the bottom window that the footsteps in the selected folder, boot_floorboards, are in sequential order. This was necessary so that the original footsteps of the Foley artist could be preserved, ensuring an accurate recreation of each sequence of footsteps. Each set of footsteps had its related scuffs, as seen in the top window. The middle window shows other sounds that were used in the installation.

with my language, and eventually our lexis began to harmonise.⁷⁸ The use of flowcharts helped me to clearly communicate what I wanted in a language conducive to the programming environment of Max/MSP. For example, Image 37 shows a flowchart mapping out my ideas relative to the activation of sounds within the installation.

Max/MSP was used as a delivery system. Primarily the 'sin', 'drunk', 'umenu', 'cycle' and 'SPAT'⁷⁹ objects were used to generate random

78 After this experience, I came to realise that when working with design technology it is important to have some knowledge of the potential and language of the technology, even if commissioning someone else to handle this aspect of the work for you. Since then I have completed a beginners and advanced course in Max/MSP in preparation for my next encounter with a Max/MSP expert. My experiences developing the WasP software with Jeffrey Hannam also contributed to this insight.

79 SPAT is a Max object created by IRCAM for the spatialisation of sound and the application of perceptive criteria to create specific characteristics of space. See <http://forumnet.ircam.fr/product/spat/> (accessed 30/07/2014) for more details.



Flow Chart for Intimate Footsteps Installation

To be read in unison with Breakdown document.

Image 37: Flowchart for the design of the Intimate Footsteps delivery system

This particular flowchart describes the behaviour of footsteps and meeting point sounds, and forms what became the sequence in the final installation. Flowcharts became an essential form of communication between myself and the Max/MSP program designer: a kind of meeting ground between poetic dreams and logical processes.

paths upon which randomly selected footsteps would walk. Images 38 and 39 provide screenshots of the path generators and footstep selectors decided upon during the final programming.

This aspect of the programming was successful. What was not successful however, was the attempt to “stick” the sounds of footsteps to the plane of a speaker array, which is described in the following section.

This window shows the use of the 'drunk' and 'sin' objects to generate random paths for each selected set of footsteps. The bottom patcher, p_file_player, opens the window shown in Image 39.

This window shows the use of the 'drunk' and 'sin' objects to generate random paths for each selected set of footsteps. The bottom patcher, p_file_player, opens the window shown in Image 39.

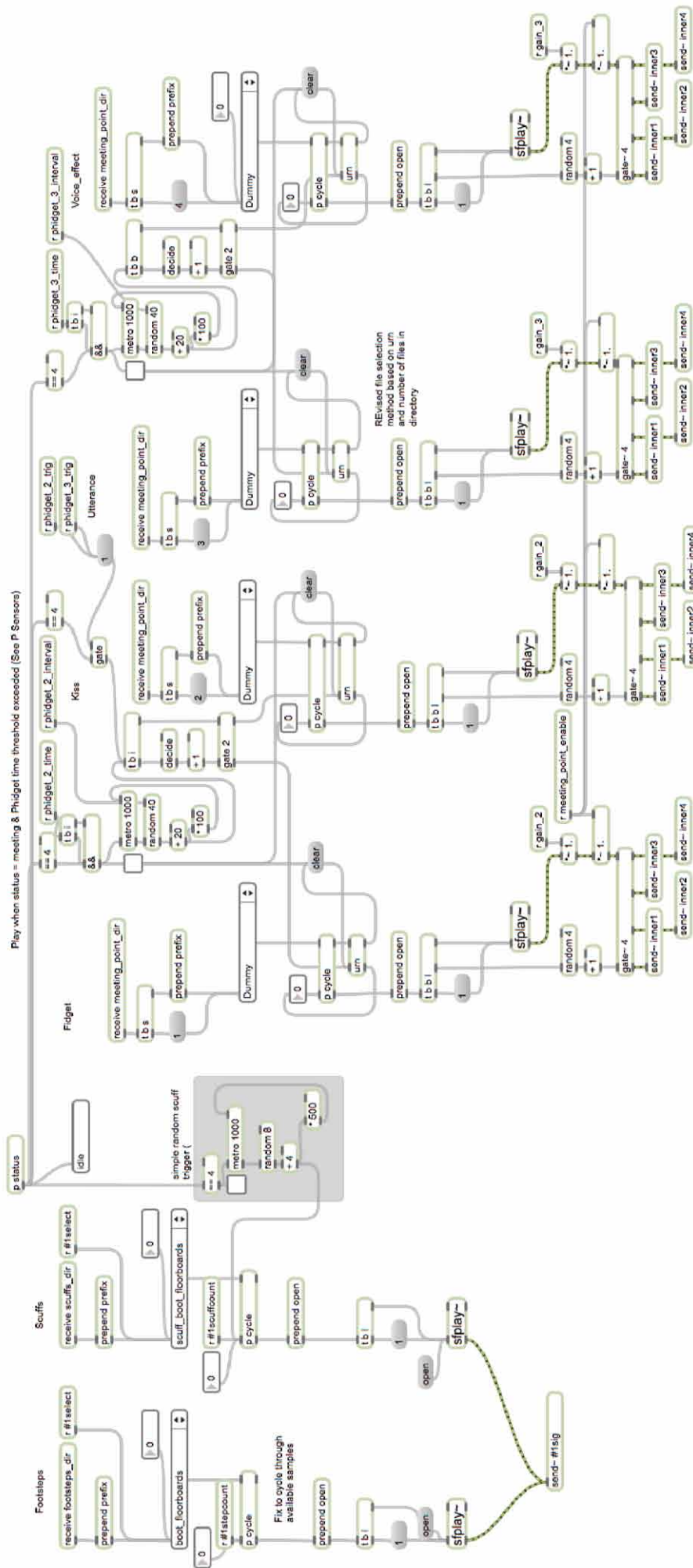


Image 39: Max patch for footsteps and intimate sounds selector
 This window shows the various 'umenu' and 'cycle' objects that were used to randomly select footsteps for the generated paths shown in Image 32, and the various meeting point sounds

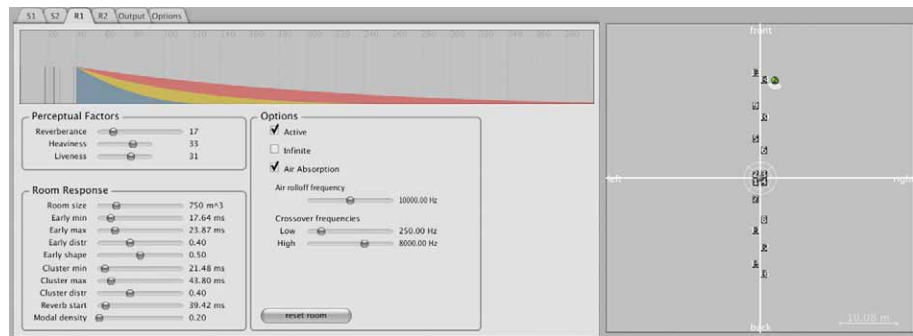


Image 40: The SPAT object

The SPAT object is designed by IRCAM. Reverberation characteristics can be set in the left window, and the speaker configuration is mapped in the right window. The black squares represent speaker placement, and the green circles represent sound sources, which in this case were the footstep paths.

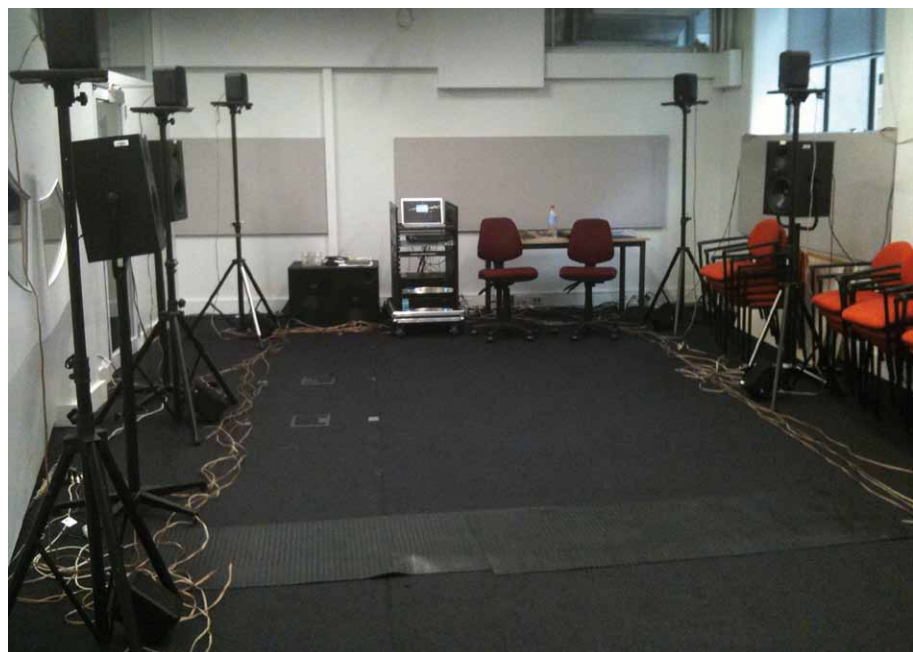


Image 41: Testing speaker arrays

The delivery system for Intimate Footsteps was tested in SIAL Sound Studio's n-space. The original configuration, pictured, involved a line of four speakers either side of the room, both on the floor and elevated. Effectively, this was an xy plane that had been folded into three planes.

Testing with speaker arrays

Testing using speaker arrays was carried out with 16 JBL speakers connected to two Ampeg amplifiers with figure-8 cabling, which were networked to a Mac laptop computer with a Motu traveller soundcard connected to a Creamware A16 Ultra AD/DA Converter. The SPAT object allowed speaker mapping commensurate with real-world dimensions, within which the paths could be generated (see Image 40 for detail of the SPAT object).

We eliminated the z-axis and considered only the xy axis, as we didn't need the footsteps to run through space, just along planes such as walls, floors and roofs (consistent with my desire to create a vortex of footsteps that would swirl around the listener, an approach which I was still considering at this stage). As such, SPAT was programmed to generate sounds for a 2D speaker array; however, the actual speaker

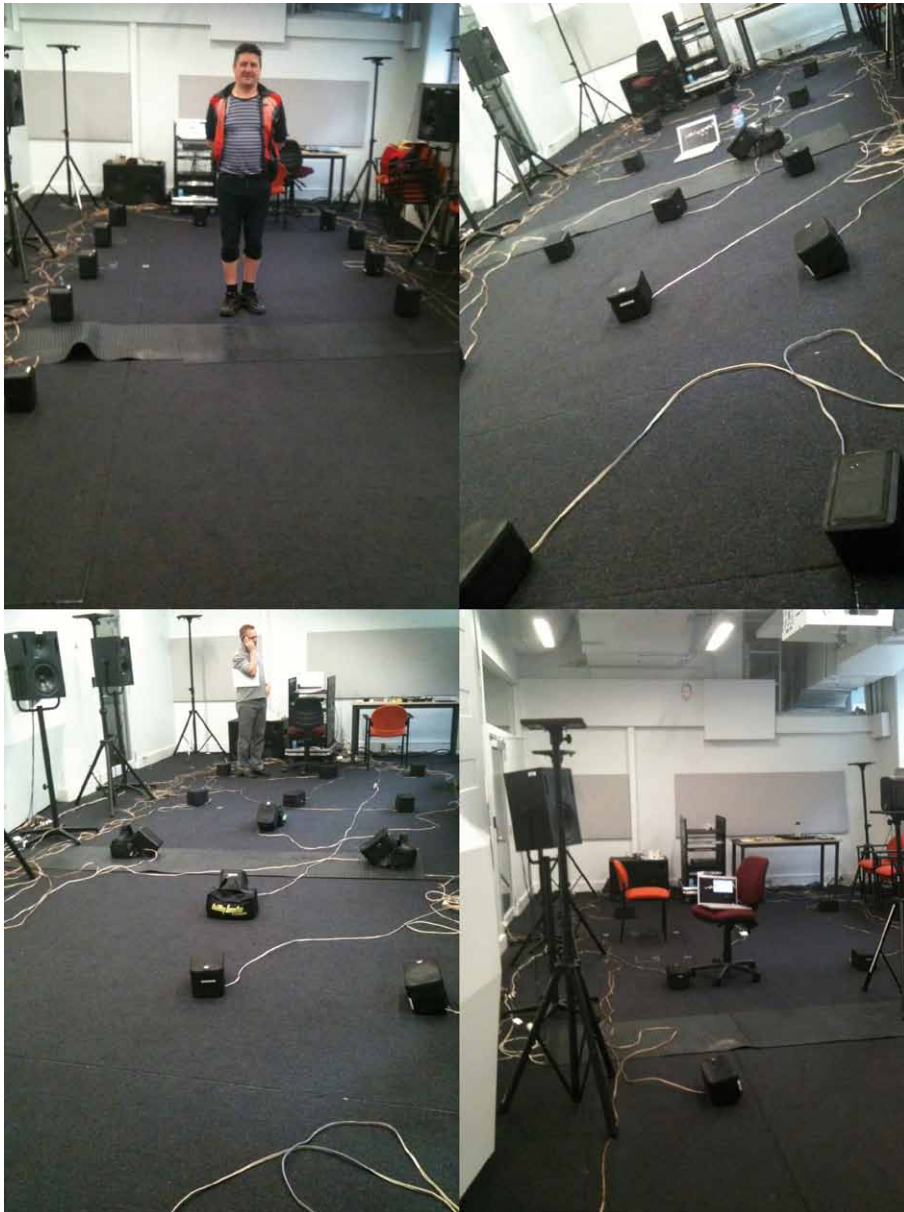


Image 42: Testing speaker configurations

The top left image shows two lines of linear-arrayed speakers (and Steve Adams). The top right shows a random array of speakers. The bottom left image shows an inner quad with a matrix array surrounding the inner quad (with Lawrence Harvey in the background). The bottom right image shows an inner quad and outer quad. This was deemed the best configuration and became that of the final installation.

array was “folded” into three planes that created a “u-shape” speaker array with the lower central horizontal plane and upper speakers at 90-degree angles to the two outer vertical planes. Image 41 shows this configuration. We hoped that the SPAT software would allow us to locate sound with such specificity that sounds could be perceived as being isolated at any given point within the array. In actual fact, the sounds had no locational specificity at all. They seemed to fill the whole space, and any movement detected sounded random. This was particularly true of the elevated speakers. Perhaps further testing would have resolved the problem, but we were on a deadline and had to work with the given situation.

We tried several other speaker configurations as seen in Image 42. By this stage we had placed all speakers on the ground and were

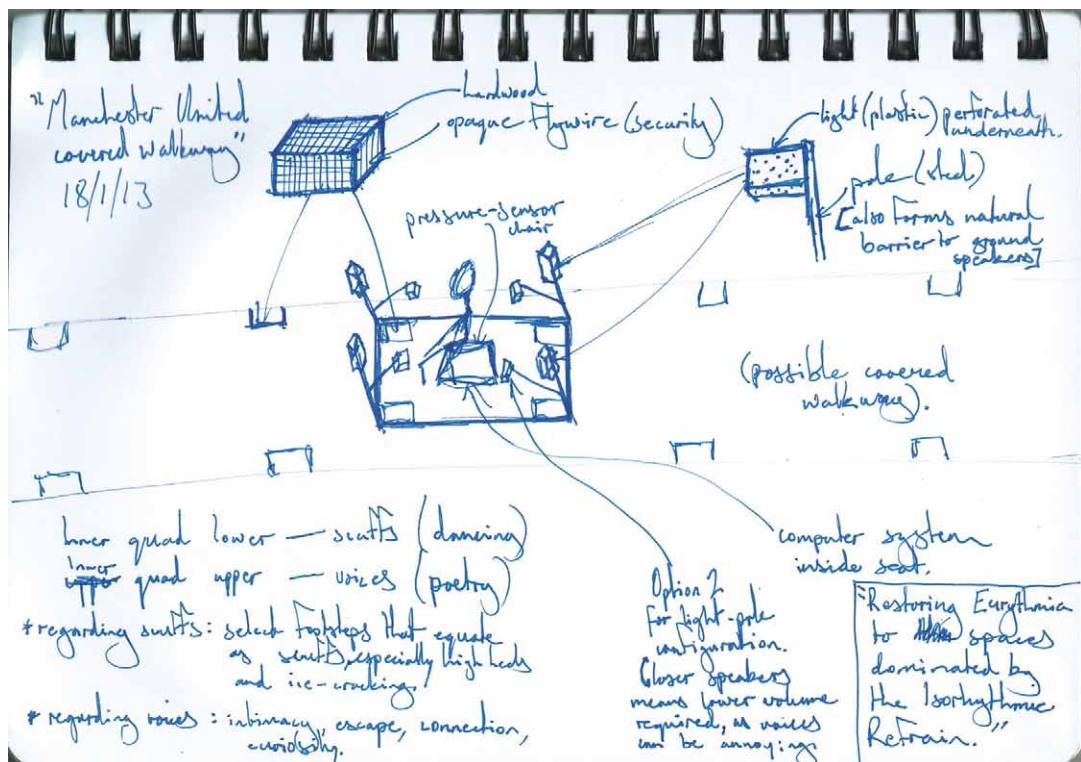


Image 43: The final configuration for Intimate Footsteps

The speaker configuration and speaker placement was finalised in this sketch. This image was constructed for Howey Place, but in fact was used for the Design Research Institute's Convergence exhibition at RMIT University's Design Hub. Note the inner cube of speakers, and the expanding quad configurations stretching in either direction.

just trying to find a sonic image that worked, specifically one in which the feet ran toward the centre of the room. We never quite achieved the effect we were after; it was a very frustrating process. Finally we decided on the bottom right image seen in Image 42, an inner and outer quad, as the best configuration for the installation. An additional change was that the initial idea of several footsteps became a fixed number of two. Multiple footsteps just sounded cluttered and confusing, whereas a pair of footsteps coming from either direction provided a clearer sonic image.

The interactive chair

The initial idea was to install a camera that would recognise the image of a passer-by and trigger the footsteps. I had imagined a scenario in which a person walking along a street would activate several footsteps, which would approach the passer-by in a vortex-type pattern. We realised that this was only going to work if the person activating the installation purposefully lingered in a single spot. With this realisation my entire initial premise was summarily discarded; rather than considering the footsteps walking along with the passer-by, I now considered that the footsteps would walk to a centre point in which a stationary listener was situated (which is also in keeping with the results of the speaker arrays, described above, in which central termination points



Image 44: Intimate Footsteps installation

Four speakers playing sounds of intimacy are suspended from the tripods. The lower quad plays the scuffing sounds after the arrival of the virtual pair of footsteps, one from either end of the ramp. The speakers can be seen to stretch to the end of the ramp, forming a path for the footsteps to trace. In the background is a short video loop of the proposed site, Howey Place. The chair is wired up and connected to Max/MSP, on the computer system, which is located behind the pink chair.

were determined to provide a clearer sonic image). I decided that a chair in the middle of the installation was a better option: this would provide a fixed listening position at which two pairs of footsteps would congregate. Suddenly, rather than a gathering of nomads tracing sonic vortices, I had two virtual people approaching one another and meeting where a central listener was positioned. I was familiar with the work of a colleague, Frank Feltham, who had previously collaborated with SIAL Sound Studios. Based on my conceptual direction, Frank designed an interactive chair for the work; when someone sat down on the chair, the footsteps were triggered. If the listener stood up before the footsteps reached them, the steps completed an agitated shuffle and then returned to their initial position. If they reached the chair however... well this new possibility changed everything. I decided to place a cube configuration around the chair with the bottom four speakers playing the scuffing shoes of the virtual pair, and the elevated four speakers playing the sounds of the virtual pair kissing, embracing, moaning and saying occasional words to one another. The outer quad stretched to either end of the space as a repetition of expanding quads to provide a pathway for the footsteps. Image 43 is a sketch of the final set-up, which was intended for Howey Place.



Image 45: The installation at work

The sounds of passion, and their interactive capacity, provided great enjoyment for listeners. There were two triggers at the end of the arms of the chair: tapping triggered the sounds of kisses, while squeezing triggered moaning, kissing, hugging sounds and spoken sweet nothings. Participant involvement in the installation revealed the inadvertent creation of a "Passion Machine".

The sounds of intimacy were recorded on an NT2 Rode Microphone with Rebecca Pohlner. The microphone was set to an Omni pattern, and sitting opposite one another, we kissed, moaned, groaned and spoke to one another. Frank Feltham designed hand triggers to set off the kissing, moaning and voice sounds, and Steve Adams integrated this feature into the existing Max/MSP programming to allow random playback of the intimate sounds at different rates, depending on user interaction. The consequence was that the listener was now in between, and in control of, the sounds of passion. If the listener tapped the triggers at the end of the arms of the chair, which would only work once the virtual couple had successfully reached the chair, then the sounds of kissing were triggered. If the listener squeezed the ends of the chair, then voices, moans and kissing were activated. The harder the squeeze, the more intense the passion: I had inadvertently created THE Passion Machine!

Project Installation

The work was tested during a two-day installation, from Saturday 4th May to Sunday 5th May, 2013. It was located on a long, thin ramp on level one of the design hub at RMIT University City Campus. The installation included a Mac laptop running Max/MSP connected to two Motu soundcards and a Creamware A16 Ultra AD/DA Converter that together formed a composite device in Max/MSP. The computer system was networked to 20 speakers, 16 JBLs and 4 Tannoys (simply because I had run out of JBLs). The four speakers forming the upper quad of the cube were placed inside fishing net and suspended from two tripods. See Image 44 for the final setup.

Image 44 points towards the covered end of the ramp. Generally the footsteps sounded more convincing from this end, perhaps the enclosure created a reverberant effect that encased the footsteps. In comparison, when coming from the other end, which compared to the covered end of the ramp was open space, the footsteps seemed



Image 46: Recording the installation

A binaural head was used to create a recording of the installation. I sat in the chair and triggered a sequence of footsteps and passion sounds which can be heard in Audio Sample 23.

to be floating about a meter off the ground. In Image 44 the chair is oriented to face the video image at the end of the ramp; however, it was quickly discovered that rotating the chair 90 degrees (see Image 45) created a stronger sonic image as the ears were pointed towards the footstep paths. Most people⁸⁰ who tried the installation were of the opinion that the footsteps were interesting on the first listen but after this the illusion was quickly broken. The sounds of passion, however, elicited endless joy and curiosity, as suggested by the expressions of participants seen in Image 45. Watching the smiles and occasional uncomfortable squirms of participants was a treat.

Regarding the type of footstep surfaces, hard soles on floorboards sounded the most convincing. Leaves, puddles, ice and snow surfaces had a homogenous texture in the space (but not in the studio during testing), in the sense that they all sounded like a gravel surface. I believe their presence was less convincing, as the sounds were so out of context with the hard surfaces of the Design Hub, which is made of metal and concrete. High heels, boots and sneakers on concrete had a more convincing presence, and at times seemed to merge with real footsteps in the space, as can be heard in Audio Sample 23. Eventually I decided to turn off the SPAT reverberation as there was enough reverberation in the space already. This made a huge difference to the perceived realness of the footsteps, as

⁸⁰ I completed extensive interviews as part of this project with ten different experts in design and ten members of the general public. However, I will pursue this as an ethnographic study, along with data collected for *Revoicing the Striated Sound(scape)*, in later publications. As stated earlier I deemed it more important to discuss the making of the projects and their relationship to my theoretical contributions to knowledge in this ADR.

81 Generally the response was one of initial surprise at the emergence of footsteps, and mirth at the opportunity to extract sounds of pleasure from the chair. The illusionary affect of approaching footsteps was quickly dispelled; however, the capacity to control sounds of intimacy was of endless fascination. I suspect this is due to the level of control users had over the intimate sounds. For some, the installation became a type of musical instrument.

82 The artist Susan Philipsz creates enchanting public sound installations in which a female voice sings ancient folk songs to fill urban acoustic spaces such as bridges and laneways. Her work has the effect of mythologising the contemporary city. *Intimate Footsteps* differs from this, but in regard to the use of human voice to evoke experiences, there are parallels. For an example, see her piece *Lowlands* at the following link: <http://www.youtube.com/watch?v=Kp1ljBycbdl> (accessed 30/07/2014).

they were able to generate their own reverberation according to the dimensions of the space rather than being affected by SPAT's artificial reverberation. A recording of a triggered sequence can be heard in Audio Sample 23. The sample was recorded with a Pro-Sound Neumann KU 100 Binaural Dummy Head Microphone System into a Sound Devices 722 portable audio recorder, as shown in Image 46. In this recording, all possible sequences from the flowchart in Image 37 have been recorded, though not all possible variations of sounds, which were randomly selected in Max/MSP.

Audio Sample 23: A triggered sequence from *Intimate Footsteps* (2m 34s)

All possible configurations of sounds are heard in this file. At 1 minute and 10 seconds, a merging of installation footsteps and real footsteps can be heard, which provides an interesting comparison. Note the air-conditioning sounds in the background, an interesting reminder of the ubiquity of the striated sound(scape).

Project Findings

Intimate Footsteps stands out from the other projects as not being realised in an outdoor public space; however, it was relevant as a sound(scape) design project due to the transformation of space that occurred in the Design Hub. In particular was the project's capacity to transform site-specific sounds, especially the clacking of high-heels merging with the forthright footsteps generated in the installation, and the moments of intimacy it afforded in a building that is somewhat austere in its material forms of glass, steel and concrete. Furthermore, the installation's location on the lower level ramp meant it was situated in a typically transitory space that was now a space in which people lingered and gained meaningful sonic experiences.⁸¹ Two important discoveries of the installation were that, firstly, it became clear that two sets of footsteps only were required, and that testing of footstep types should occur in a space before footstep types are decided upon. Secondly, the addition of intimate sounds changed the work's focus. What began as a dream of creating a vortex of sounds, became the in-between space of a partially generative intimate encounter between two imaginary people. Once the work is installed in an outdoor public space, rather than challenging the rhythms of the everyday, this piece may be more effective at challenging the alienation of the everyday.⁸² I would suggest that the lack of communication and expressions of passion on urban streets is the consequence of the affects of spatiotemporal controls as described in the conceptual tools, *Radiating Striations of Centralities* and *The Isorhythmic Refrain*. With this installation, there is a chance to install an object of passion in an urban space, where the listener is immersed in the sounds of passion that intensify as the gestures of the listener's hands intensify. Perhaps this offers an alternative to the typically understood "noise-free" site-of-respite; instead this is an "alienation-free" site. I imagine a citywide installation of Passion Machines that provide respite from the cold detachment of alienated streetscapes, through the production of localised spaces of passion.

4.2 Conceptual Tool IV: *The Isorhythmic Refrain*

Another brief note regarding the conceptual tools

Conceptual tool IV: *The Isorhythmic Refrain*⁸³ emerged at the bifurcation point shown in Figure 2. This is marked by my interest in Lefebvre's *Rhythmanalysis*, particularly his description of rhythmic presences that shape human experiences of space. I was also familiar with Deleuze and Guattari's sonic focus in their chapter *The Refrain*, which is partly concerned with the power of sound to territorialise, deterritorialise and reterritorialise space and experience through repetition. Similarly to the first conceptual tool, *Radiating Striations of Centralities*, I began to see connections between the texts that provided me with a language to describe temporal observations gathered while immersed in my works in public urban spaces. It was the repetition of similar gestures and events across the city that I found intriguing, and to which my project work responded, particularly in the attempt to recreate, or repattern, the temporal for the emergence of diverse experiences in space. As stated in the introduction to conceptual tool I, I consider the conceptual tools to be "philosophy coming to life" through the process of making; however, to be clear, as stated previously, the conceptual tools emerge as a result of making, not the other way around. Furthermore, the conceptual tools are reassemblages of ideas that are idiosyncratic to my practice; as such, I don't expect the conceptual tools to be considered contributions to philosophy, but as potentially applicable tools for practitioners in the field of sound(scape) design. The reader may wish to refer to Appendix 1, which defines certain terms used in the description of *The Isorhythmic Refrain*.

The Isorhythmic Refrain

Deleuze and Guattari, and Lefebvre, provide concepts of time that are musical. In particular, repetition and rhythm are a way to understand the unfolding and capturing of time, and thus, are of particular interest to the sound(scape) designer who seeks to create sociopolitical change through sonic means. Deleuze and Guattari's chapter *On the Refrain* explores the territorialisation of space through repetitive, particularly sonic, motifs.⁸⁴ They make use of many musical terms including refrains, motifs, counterpoints and rhythms. Likewise, Lefebvre's *Rhythmanalysis*, which analyses space through the rhythms that inform social organisation, also utilises the language of music in its descriptions. Thus music, and more generally the sonorous, is significant to the *Refrain's* and *Rhythmanalysis's* descriptions of time. Time, like music, is perceived as polyphonous, capable of shifting its tempo, dynamics and character.

Deleuze and Guattari contend that the sonorous holds a unique place in the refrain. They state:

"The refrain remains a formula evoking a character of landscape. The refrain has two poles. These poles hinge not only on an intrinsic quality but also on a state of force on the part of the listener" (Deleuze and Guattari, 1997, p. 385).

The link between character of landscape and listening is significant for sound(scape) design approaches. The refrain exists autonomously in

83 This conceptual tool was included in a paper I wrote for *Sound Effect: An Interdisciplinary Journal of Sound and Sound Experience* (Vol. 3 No. 3) titled "Conceptual Overlays for Urban Soundscape Design Emerging from a Transversal Analysis of Lefebvre, Deleuze and Guattari, and Arendt".

84 For further discussion on the relationships between urban sounds and the refrain see Jacob Kreutzfeldt's (2012) recent article which "seeks to outline a fertile area of study for sound studies: the investigation of everyday refrains and the environmental relations they express and perform" (p.1).

85 Henri Lefebvre uses the term “natural” at length. However, he doesn’t necessarily intend it to mean spaces defined by trees, rocks and rivers (etc.) but as spaces that are honest, in contrast to urban spaces which are duplicitous insofar as what is represented by its spaces can suggest one thing while actually meaning another (such as the power relationships discussed above in, *Towards Conceptual Tool 1: Discovering Bureaucratic Power Networks That Protect Noise*). In this sense, any space, regardless of location, could be considered to be natural if it is honest, that is, if the relationship between space and self is unmediated. This discussion will be taken up in Chapter 6 where I will elaborate on the ecological focus of my practice.

86 Birdsong is of course, encountered in urban spaces. The intention here is not to draw a line between the urban and the natural. Both spaces are considered to exist in mixture. My argument is that the isorhythmic refrain tends to be more dominant in urban spaces than it is in nature spaces.

87 This conjecture resonates with Steve Goodman’s (2010) reflection that Lefebvre (and his predecessors) explorations of rhythmanalysis were overly “concerned by the equilibrium of rhythmic systems, by their harmonization in a hierarchy of instants”(p.88).

88 Bruce Odland’s and Sam Auinger’s *Harmonic Bridge* could be described as a eurhythmic soundscape installation, in which the overhead drones of traffic are transformed into a harmonic structure. See <http://vimeo.com/71463497> (accessed 05/08/2014). Somewhat similarly the *Sea Organ* located in Zadar, Croatia, and created by the architect Nikola Bašić, reinterprets the turbulence of the ocean into harmonic sounds. See <http://www.youtube.com/watch?v=4nISG7iBk-A> (accessed 05/08/2014).

a space, while simultaneously evoking experiences that territorialise or deterritorialise space as related to the immanent lived experience of the listener. A repetitive refrain that exists unimpeded, becoming embedded in the everyday, has the effect of territorialising space and causing repressive listening experiences (for example, the day-to-day drone of air-conditioners, or Muzak piped into consumer spaces). However, refrains can also diversify space by activating both poles of listening, that is, the affected listener and the affective space, with the continuous process of deterritorialisation and reterritorialisation. As such, the refrain allows sound(scape) designers to recognise and challenge spaces dominated by repetitive sonic refrains by responding with counter-refrains that affect creative listening responses.

In *Rhythmanalysis*, Lefebvre describes time as a mixture of the cyclical and the linear repetitive, which suggests a similarity to the relationship between striated and smooth space: “cyclical repetition and the linear repetitive separate out under analysis, but in reality interfere with one another constantly” (Lefebvre, 2004, p. 8). Like smooth space, cyclical time refers to the open, the “natural”,⁸⁵ and like striated space, linear time refers to the repetitive patterns of functional spaces. In the convolution of Lefebvre’s, and Deleuze and Guattari’s temporal conceptualisations the refrain can be understood as having either a natural cyclical or linear repetitive quality, where natural cyclical refrains are common to nature space (see footnote 85) and linear repetitive refrains are common to urban space. For example, Deleuze and Guattari discuss the capacity of the refrains of birdsong (as discussed above) to instantly and unpredictably territorialise, deterritorialise and reterritorialise their surroundings. In contrast, the refrains of urban spaces are informed by technologies that dominate space through linear repetition⁸⁶ (for example ventilation outlets, sirens, Muzak, and pedestrian crossing signals).

Lefebvre dedicates a chapter in his *Rhythmanalysis* to dressage, which provides a challenge to Deleuze and Guattari’s sonorous emphasis on the refrain. In the chapter Lefebvre describes the effects of space on people’s gestures, which are informed by a military model:

“Societies marked by the military model preserve and extend this rhythm through all phases of our temporality: repetition pushed to the point of automatism and the memorization of gestures...” (Lefebvre, 2004, p. 40).

Here we find cyclical and linear rhythms in mixture, where the linear repetitive gestures of city workers and consumers (gait, footsteps and transport routes) are contained within the cyclical rhythms of social organisation (as organised along the Earth’s cyclical day/night axis). This convolution of gestural and sonic expressions in the human rhythms of social organisation exists alongside the linear repetitive rhythms of technologies. The ubiquity of the linear repetitive refrain in both human activity and technological functions is suggestive of an abstract quality that unfolds throughout urban space, and as such can be considered a controlling *presence* in space (which, as will be explained, is known as *The Isorhythmic Refrain*). Here the refrain becomes synonymous with an oppressive landscape. As Deleuze and Guattari explain, “(the refrain) also effects the most massive of reterritorialisations, the most numbing, the most redundant... (Deleuze and Guattari, 1997, p. 383).

A rhythmanalysis is concerned with detecting the presence of space, which informs the present (immediate experience): “(t)he act of rhythmanalysis, transforms everything into presences, including the present, grasped and perceived as such” (Lefebvre, 2004, p. 23). The present is immediate lived experience, but presence is what a rhythmanalysis will uncover: the affective forces in space. Lefebvre distinguishes several types of rhythm as presences informing space. Of particular interest to the sound(scape) designer is eurythmia, arrhythmia and isorhythmia. “Eurythmia (that of a living body, normal and healthy) presupposes the association of different rhythms. In arrhythmia, rhythms break apart, alter and bypass synchronization” (Lefebvre, 2004, p. 67). Perhaps in this comment Lefebvre is proposing a therapeutic model for space where identified arrhythmias might be reconfigured as eurythmias. The closest he comes to suggesting this is: “intervention through rhythm... has a goal, an objective: to strengthen or re-establish eurhythmia” (Lefebvre, 1991, p. 68). In his preferencing of eurythmias, Lefebvre seems to be suggesting the establishment of a harmony of rhythms;⁸⁷ however, arrhythmia may be as equally desirable as eurhythmia when the sound(scape) designer is confronting isorhythmias. Lefebvre attaches no obvious qualities to isorhythmia, describing them simply as “the equality of rhythms” (Lefebvre, 2004, p. 67), which are comparable to a conductor who ensures an orchestra is equally synchronised to the same rhythm. The presence of isorhythmias are considered here as controlling refrains that unfold throughout urban space, sonically manifesting in the gesture of workers, consumers, and the operations of technology. In response, creative sound(scape) design seeks the deterritorialisation of the isorhythmic refrain by reterritorialising space with eurhythmic⁸⁸ and arrhythmic⁸⁹ sound(scape) installations (footnotes 88 and 89 provide examples of installations).

A refrain can be considered as cyclical or linear. Isorhythmic refrains tend toward the linear repetitive, in that the isorhythmic refrain controls (territorialises) space through repetition. An example of this is music produced by the Muzak Corporation,⁹⁰ which actively territorialises space with sonorous linear repetitive rhythms that encode space for consumerism and industriousness. Sound(scape) installations that manifest sonic eurhythmias and/or arrhythmias are able to create (territorialise) or repattern (reterritorialise) refrains within the urban sound(scape)⁹¹, which challenges the homogenising impact of the isorhythmic refrain.

Project Research Outcomes: *Intimate Footsteps*

Intimate Footsteps is a bifurcation, which sits apart from an otherwise conceptually consistent unfolding of projects (see Figure 2). Rather than transforming the ubiquitous sound source of rush hour footsteps in a public space, the project enabled users to trigger an intimate moment between two virtual people of which the user is both in-between and in control. *Intimate Footsteps* reintroduces passion into public spaces, which is experienced by individuals as the joyful and visceral sensations provided by its interactivity. The trial run of *Intimate Footsteps* is the realisation of a “Passion Machine” with potential for public installation.

89 Sound-artist Max Neuhaus' sound installation *Times Square* references on-site sounds to manifest diverse tonalities without rhythmic (temporal) reference (See Labelle, 2006, pp.156-8 for further discussion). A short movie describing the installation can be accessed here: <http://www.max-neuhaus.info/timesquare.htm> (accessed 28/01/2014). Bill Fontana's *White Sound: an Urban Seascape* dissolves the daily rhythms of city traffic by introducing live recordings of a distant seaside. An example of the seaside recordings can be accessed here: <http://www.youtube.com/watch?v=jANuvENKMRk> (accessed 03/08/2014).

90 The Muzak Corporation has a website that divides music into categories suitable for the soundscapes of different businesses. This demonstrates the ability of refrains to striate space (in the sense of zoning and determining experience) by sonic means. See <http://www.muzak.com/products/music> (accessed 05/08/2014).

91 As described in footnote 89 Max Neuhaus and Bill Fontana provide examples of the potential to reterritorialise space with public soundscape installations that reference site-specific sounds. However, the reterritorialisation of space is equally applicable for indoor and/or private settings. For example, Alvin Lucier's *Sitting in a Room* is an indoor-based sound installation in which a repetitive motif of a speaking voice – generated with the use of tape recorders, amplifiers, speakers and microphone – takes on the characteristics of the resonant frequencies of a room. The repeating voice can be considered a refrain that reterritorialises space with each repetition (see LaBelle, 2006, pp. 123-132 for further discussion). Agostino Di Scipio, a contemporary composer and sound-artist, creates installations and concerts by reworking the acoustic material of a room with microphones and speakers. (See <http://agostinodiscipio.xoom.it/adiscipi/> for more information). Di Scipio's technique could be considered one that challenges the territoriality of site-specific refrains.

5 Transformation: towards the creation of meditative atmospheres

5.1 Project 5: *Subterranean Voices*

Project Synopsis: *Subterranean Voices*

Subterranean Voices was commissioned by the Liquid Architecture 14th National Festival of Sound Art in the Trench, a disused service area beneath Federation Square, Melbourne, situated between two busy train platforms at Flinders Street Station. Twelve 20-minute performances were completed over two days on the 31st of August and 1st of September 2013. The work was realised as an eight-channel electroacoustic performance, playing synthesised sounds originally recorded in the Trench. I spent a month in the Trench before the performances, applying the *Repatterning the Urban Sound(scape)* methodology discovered in *Revoicing the Striated Sound(scape)*.

Subterranean Voices was an electroacoustic performance that I completed on the 31st of August and 1st September 2013 in the Trench, a large concrete cuboid situated beneath Federation Square in Melbourne, Australia. I was approached by Philip Samartzis and Kirsten Sharpe, curators of the Liquid Architecture 14th National Festival of Sound Art, to participate with a work. The theme of the festival was *The Sonic City*, which “explores how sound art and related art practices can respond to the protean and transformative nature of cities”.⁹² I joined the curators for a site visit at Federation Square, and was immediately drawn to the strange subterranean environment presented by the Trench. To get there, one had to walk through labyrinthine tunnels behind the facades of Federation Square, enter a lift that travels underground, and then emerge in a space that is surreal: a cavernous concrete cuboid,⁹³ upon either side of which are busy suburban railway platforms. Philip Samartzis mentioned at the time that the original intention was to have Francisco Lopez⁹⁴ create a work in the space, but after visiting the Trench it was deemed too noisy for a musical performance. The blast of a train horn filled the space just as he finished this comment as if to emphasise his point! I had been invited to participate due to my experience in working with industrial sounds, specifically during *Revoicing the Striated Sound(scape)*. This presented the perfect opportunity to realise my fifth project for the PhD, *Subterranean Voices*, in what were ideal laboratory conditions for testing methodologies developed in earlier projects.

92 For more information, see the curatorial essay on the Liquid Architecture website at <http://www.liquidarchitecture.org.au/about/> (accessed 30/07/2014).

93 Frustratingly, I could never access the exact dimensions of the space, but I would estimate the Trench to be 5m wide, 8m high and 30m long.

94 The connection with Lopez here is interesting. I would consider my own approach to Acoustic Ecology somewhat consistent with Lopez who “considers himself an ecologist; yet rejects many of the assumptions and practices of the Acoustic Ecology movement” (Cox and Warner, 2004, p.82). Lopez considers environmental sound as acousmatic; examples of this are cicada sounds, which can be heard, yet the cicadas cannot be seen. Lopez uses field recordings to create profound listening experiences for his blindfolded audience. I would regard my work in the Trench to have taken a similar approach, but in regard to the transformation of urban noises.

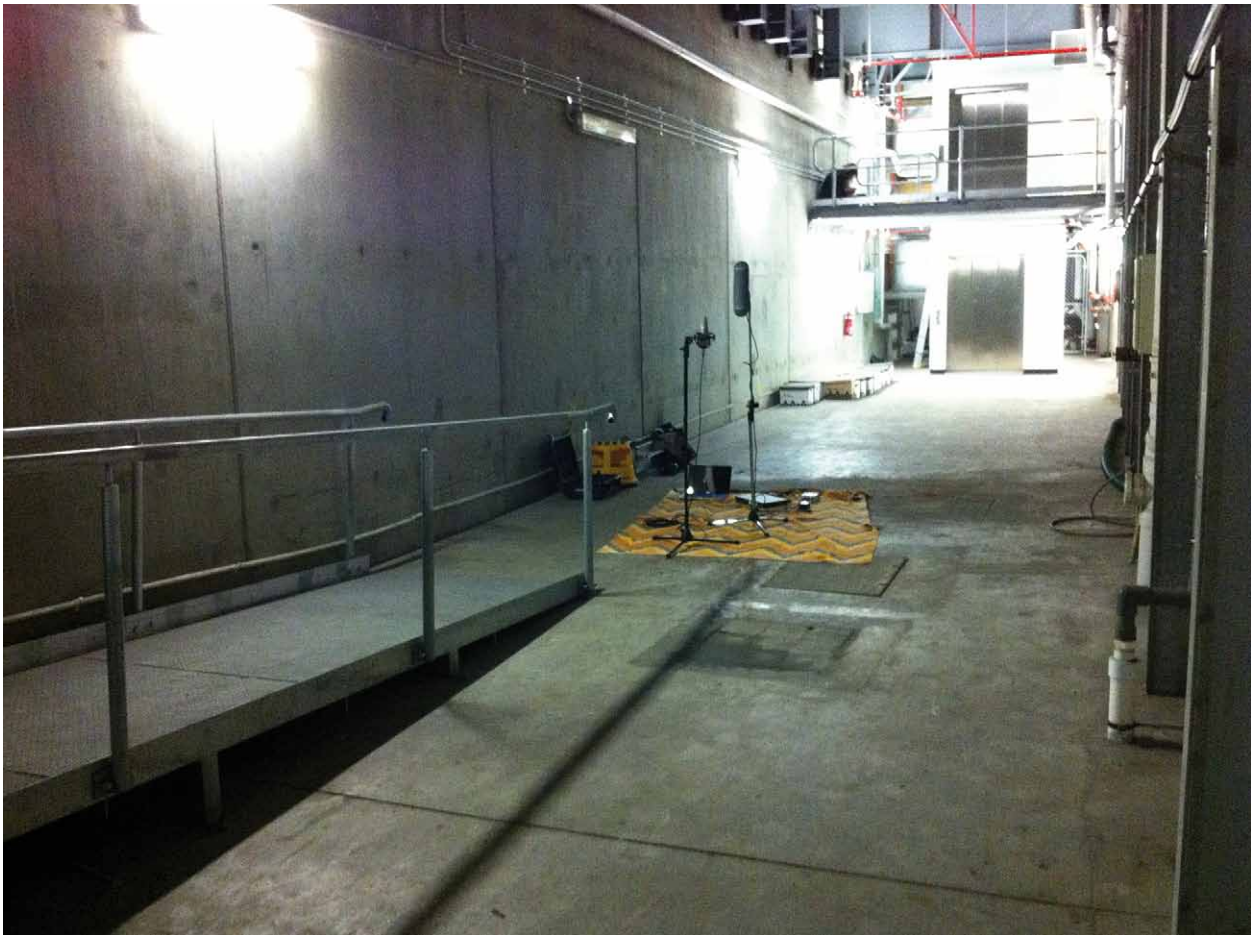


Image 47: Recording in the Trench

This image gives a sense of the unusual dimensions of the Trench. It has similar dimensions to a train platform, and is full of the sounds (but not sights) of trains, which arrive and depart on platforms on either side of the Trench's walls. Recordings were taken with an Ambisonics Soundfield microphone and an Omni NT2 Rode microphone, both of which can be seen in this photograph.

Related Works

95 Visit <http://www.sonicobjects.com/index.php/projects/more/ghostrain/> (accessed 03/08/2014) to read more about this project.

96 To hear this piece, visit the following link: <https://soundcloud.com/drsonique/ghostrain-mp3-05> (accessed 03/08/2014).

97 For more information see: <http://www.resoundings.org/Pages/Distant%20Trains.html> (accessed 03/08/2014).

98 *Strangelands* can be heard at the following link: <https://soundcloud.com/3leaves/camilla-hannan-strangelands> (accessed 03/08/2014). From 1m 55s sounds that resonate with my own approach to train transformations can be encountered.

99 See Fielden, 2000, para. 1 <http://www.jerryfielden.net/essays/PIONEERS.HTM> (accessed 03/08/2014) for further discussion of Pierre Schaeffer's use of train sounds in his early compositions.

The use of train sounds has a long-standing tradition with sound-artists. Nigel Helyer's *Ghost Train*⁹⁵ explores the relationship between sonic memory, train sounds and interviews as related to his work with the Redfern Locomotive & Eveliegh Carriage Works. The opening to *GhosTrain MP3 05 by DrSonique*⁹⁶ is particularly evocative, and recalls certain effects I developed for *Subterranean Voices*. In *Entfernte Zuge (Distant Trains)*,⁹⁷ Bill Fontana introduces a live feed of a busy railway station into what used to be a busy pre-war train station in Berlin, another example of Fontana dislocating space by superimposing geographically distant soundscapes. Recently, Camilla Hannan, a contemporary Australian composer who bases her works on field recordings, includes train sound in her recently released work *Strangelands*,⁹⁸ continuing a long tradition amongst electroacoustic composers who use train sounds for sonic material: Pierre Schaeffer was utilising train sounds in his compositions as early as the 1950s.⁹⁹ The long-standing fascination with train sounds perhaps lies in their capacity to evoke mythic intimations in the human imagination. In his 1854 book *Walden*, Thoreau captures this power through his evocative descriptions of locomotive sounds, as experienced during his isolation in woodlands:

Trench Recording: 7/8/13 (PM)

Time	Sound
1.00	Subtle drops
1.02	Passing train
1.05	PA announcement
1.08	Freight train (loud!)
1.10	Human voices
1.11	Announcement (spoken)
1.13	Train stop and take off
1.40	Hum of stationary train/water gurgle/electrical buzz
1.41	Electrical buzz off/water gurgle/PA announcement
1.42	Loud horn
1.43	Water gurgle – middle pipe
1.44	Water gurgle from right to left
1.45	Distant passing train
1.46	Close passing trains
1.48	Announcement (spoken)
1.50	Lift door opens automatically (creepy!)
1.51	Train arrives and stationary hum
1.52	Announcement with Train hum
1.54	Train hiss
1.56	Passing train
1.57	Train departs right to left
2.01	Train passing
2.02	Freight train (with rhythms)
2.03	Train hiss
2.07	Ramp (wheelchair passenger access on train)
2.12	Horn and depart right to left
2.13	Train moan (pitch shifting as passing)
2.15	Water gurgle (left pipe)/distant train horn
2.16	High pitch horn on passing train
2.17	Passing train with rhythm

Image 48: Listening in the Trench

The original notes, which were made while in The Trench, are in very poor condition. These field notes have been transcribed from those notes. This sequence of events is typical of the Trench's sound(scape), a mixture of silences and incredibly loud train horn blasts.

(W)hen I hear the iron horse make the hills echo with his snort like thunder, shaking the earth with his feet, and breathing fire and smoke from his nostrils (what kind of winged horse or fiery dragon they will put into the new Mythology I don't know), it seems as if the earth had got a race now worthy to inhabit it (Thoreau, 1910, p.146).

100 As part of Federation Square's regulations, a Warden had to be present in the Trench at all times when members of the public were present, in case of an emergency.

Connecting with the Trench (Weeks 1 – 2)

Listening to the Trench

The immediate problem I had to contend with was time. I had only one month to realise the project. And for the first two weeks of the project I could only obtain limited access to the Trench, because I needed a Warden's¹⁰⁰ certificate before I could be left in the Trench on my own; unfortunately, at the time I had to wait two weeks until the next opportunity to obtain a Warden's certificate. I immediately perceived this as an example of *Radiating Striations of Centralities*: a peripheral space waiting to be engaged with that was entirely controlled by a power network emanating from the central bureaucracy of Federation Square. It required a balanced approach on my behalf, one of patience and insistence, to both access the site and realise the transformation of its sonic ecology. The Events Coordinator was very helpful, giving



Image 49: the Trench's pipes

Pipes line the inside of the wall, carrying all sorts of waste products, including grease waste and sewage. They released horridly overpowering smells at times, but produced a wonderful sound as liquids periodically moved from one end of the Trench to the other. The blue colouring comes from blue lighting gel with which I covered the fluorescent lights. The orange colour in the background is the glow from the adjacent Flinders Street platform 13. Image © Ellen Dewar.

me access to the space on two occasions in the first two weeks so that I could do some initial listening, recording and testing in the space (see Images 47 and 48, and Audio Sample 24).

Audio Sample 24: Natural sounds of the Trench (2m 56s)

An inventory of existing sonic conditions in the Trench: sound samples include, in order, a passing train, a horn blast, a PA announcement with stationary train, a train hiss, gurgling pipes with stationary train, and a departing train. All of the sounds in this audio sample have been normalised and as such do not provide an accurate representation of the relative variation in loudness.



Image 50: Testing in the Trench

I tested repurposed sounds from previous works, especially *Revoicing the Striated Sound(scape)*. The low-frequency sounds worked in the resonant space of the Trench, but I felt they did not belong there, and so proceeded to create a work based on the site-specific sounds of the Trench.

In the first two weeks of the project, I was only able to visit the Trench twice, each time for approximately 3-4 hours in the middle of the day. During these visits I was able to connect with the Trench, and came to perceive its sonic ecology as an interconnection between a discrete range of sounds, as listed in Image 48. These included the wealth of sounds a train makes, the sounds emanating from the sewage and grease pipes that traverse the walls (see Image 49) and various electrical buzzes.

Other sounds included the automated lift that occasionally descended into the Trench (this was very creepy the first few times it happened – see Image 52) and the occasional human voice from the other side of either wall. I couldn't think of a space more removed from traditional notions of nature. There was nothing living in this place, except for me. However, it had a unique sonic ecology: a complexity of sounds emerging from the automated entities within the Trench (pipes and electrical artefacts) and from the invisible objects that were on the other side of each wall. Like the laneway, in which speakers were concealed inside readymade air-conditioners, there was an acousmatic sensibility at play in the Trench: although one couldn't see the sounds, it was clear what the identity of the sounds were. But as there was no way of knowing that one was actually sitting between two train platforms, the sounds afforded fantastic imaginative potential.

Testing in the Trench

During testing, I played some of the sounds from *Revoicing the Striated Sound(scape)*. I was concerned with the limited amount of time that I was going to have, and so decided to repurpose existing sound material. Image 50 is a photo taken during testing. I conducted these tests in the Trench on the 7th of August 2013, over approximately 3-4

101 Much as a cathedral accentuates the low frequency resonances of Gregorian chanting.

hours. The test was simply a subjective listening exercise. I used a single speaker to play a variety of sounds, particularly the deepest human voice formant drones used in *aircon_cont* (Audio Sample 13), and some of the granulated air-conditioning sounds used in *aircon_modulation* (Audio Sample 15). I felt that they sounded reasonable in the space, particularly due to the Trench's resonant and reverberant qualities, which worked well with the low frequency sounds from *Revoicing the Striated Sound(scape)*;¹⁰¹ however, I felt that the sounds did not belong to the space. This is possibly not an opinion that would have been shared by someone who was experiencing the sounds for the first time, but from my perspective I felt I was not being true to my previously explored methodologies in which sounds specific to an ecology were used in the transformation of that ecology. An interesting discovery during this testing period was the similar capacity of a stationary train and an operational air-conditioner to produce a striated sound(scape). Listen to Audio Sample 25 for an example. Both artefacts emit a loud low-frequency hum, meaning that certain sound design techniques employed in *Revoicing the Striated Sound(scape)*, particularly in relation to the tools offered by Metasynth, could now be employed in *Subterranean Voices*.

Audio Sample 25: Ambient train hums (1m 35s)

The hums of the stationary train reminded me of the air-conditioners of the city's laneways. Once again I had encountered the striated sound(scape). The discovery lends further support to the idea that striated space is an independent dimension capable of spreading everywhere. I responded by revoicing this hum with various ambiances designed in Metasynth, based on the original recordings of train hums in the Trench.

Besides this interesting comparative discovery, I concluded during these tests that I was going to have to create something specific for the space, and fast. I was under pressure, but saw this as an opportunity to apply the methodology that had developed in my previous works: listening to, recording, editing and categorising sounds, then transforming sounds and reintroducing them into the site. I'd discovered the method in *Revoicing the Striated Sound(scape)* and now I was about to apply the method in full, by *Repatterning the Urban Sound(scape)* for the transformation of the affective ecology present in the Trench.

Preparing the Trench (Weeks 3 – 4)

During weeks three and four, I spent up to twelve hours a day in the Trench. I would pack my lunch in the morning, put my warm coat and scarf in my bag and spend the day immersed in this strange environment. I was able to set up the correct speaker configuration and design the sounds simultaneously. The benefit of doing this was that I could design the sounds specifically for the space without being concerned about them translating from a studio environment. Also, it gave me the chance to become a "Trench dweller". By spending so much time in the environment I really came to understand its particularities and idiosyncrasies. Thus I was able to interrelate with and create for the Trench while my own creative interrogations were being continuously affected by the Trench's sonic ecology.

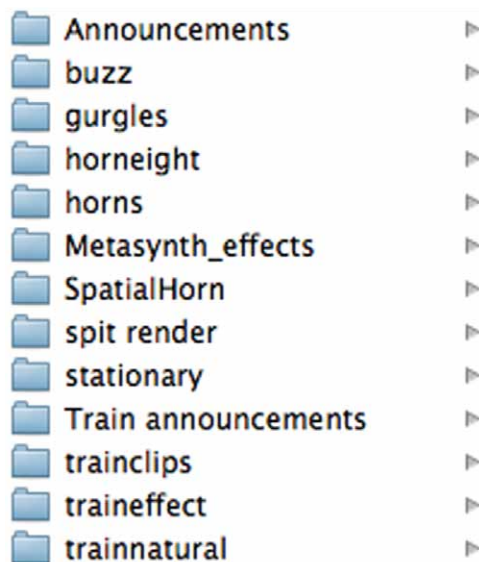


Image 51: Sound types for *Subterranean Voices*

Most sounds were based on the range of available train sounds, the sounds of gurgling pipes and the buzzes of electrical equipment. Horneight and SpatialHorn refer to files that had been rendered with WasP for multi-speaker playback.

Sound Design

As with my previous projects, I had a collection of categorised sound recordings, as shown in Image 51. I had collected recordings of the space in my initial visits to the Trench, which I edited using the region manager in the digital audio workstation Reaper.

I proceeded to edit these sounds using the same range of software used for *Revoicing the Striated Sound(scape)*. I decided to use WasP for the creation of spatialised sound files for both train horns and passing trains; however, as WasP is not a live interactive performance tool, I had to design the appropriate spatialisation in WasP and then record the four or eight outputs simultaneously between two soundcards, from one Mac laptop to another. This was time-consuming, but well worth the effort. I ended up with four or eight files for each spatialised sound that, when lined up correctly and played, produced varying spatial gestures throughout the space. In some ways it was a more liberating way to employ WasP's features, as I could now place these groups of files in any order I wished and play them from any point of time without having to reprogram. Metasynth was also used heavily, particularly in regard to its granular, time-stretching, pitch-shifting and harmonize functions in the Effect window. I made use of Ableton Live's resonators and filters. For certain sounds, such as buzzing, I added bandwidth filters with very high Q-values to match frequency amplification with the equivalent resonant frequencies of the Trench. Resonant frequencies were calculated in earlier tests by a spectrum analysis of the reverberant tail of a train horn blast. Resonant frequencies were measured at 120, 540, 1630 and 2200Hz. Filters were altered using the midi foot controller. The aim was to create extended resonances when transitioning into moments of silence.

Delivery system and speaker configuration

I decided upon Ableton Live as a delivery system for two reasons: I am knowledgeable about the program, and find its midi interface to be



Image 52: Speaker positioning in the Trench

The left image shows the single Bose speaker on the mezzanine. Announcement sounds were played from this position to recreate the sense of elevation found on train platform PA system speakers. The Bose speaker in the right image is attached to one of the brackets used for *Revoicing the Striated Sound(scape)*. Two speakers were situated like this, directly beneath the loudest points of the pipes where liquid flowed through, so as to best take advantage of transformations of this sound. Image © Ellen Dewar.

both intuitive and flexible. I ended up with 44 tracks in the session view, which were output to eight speakers arranged around the outer edges of the site. The 44 tracks were controlled with two midi controllers, a Behringer FCB1010 midi foot controller and a Behringer BCF2000 midi hand controller (see Image 53). The eight speakers included four self-powered Behringer Truths, and four Bose FreeSpace DS 100 SE Loudspeakers, the same ones used for *Revoicing the Striated Sound(scape)*, which were powered by two stereo amplifiers. I also used the custom-made speaker brackets, which allowed me to position the Bose speakers most effectively. I had two assistants that joined me as part of a Music Industry Placement in the RMIT Music Industry course. Their help was invaluable as, due to the large dimensions of the Trench, it would have been time-consuming to move the speakers around. I was able to sit at a central position (see Image 55), listen to the introduced sounds, and ask them to relocate speakers around the Trench until I had created what I considered to be the ideal speaker configuration to create the most affective listening environment. Most speakers were on the ground and angled upwards in an effort to create a more diffusive environment. Two speakers were placed against specific waste pipes that made the loudest sounds, and one speaker was placed on a mezzanine-type landing, from which transformed announcement sounds were played, recreating similar conditions to a train platform's elevated PA speaker system (see Image 52).

Live Spatial Sound Design Sessions

Once I had designed my sounds I proceeded to play with them in-situ. Audio Samples 26-29 are edits from two, one-hour live spatial sound design sessions, which I completed a few days before the performance. In these sessions I was interacting with the sounds of the Trench using a palette of fully edited sounds loaded into an Ableton Live session window, as seen in Image 54. As the real sounds

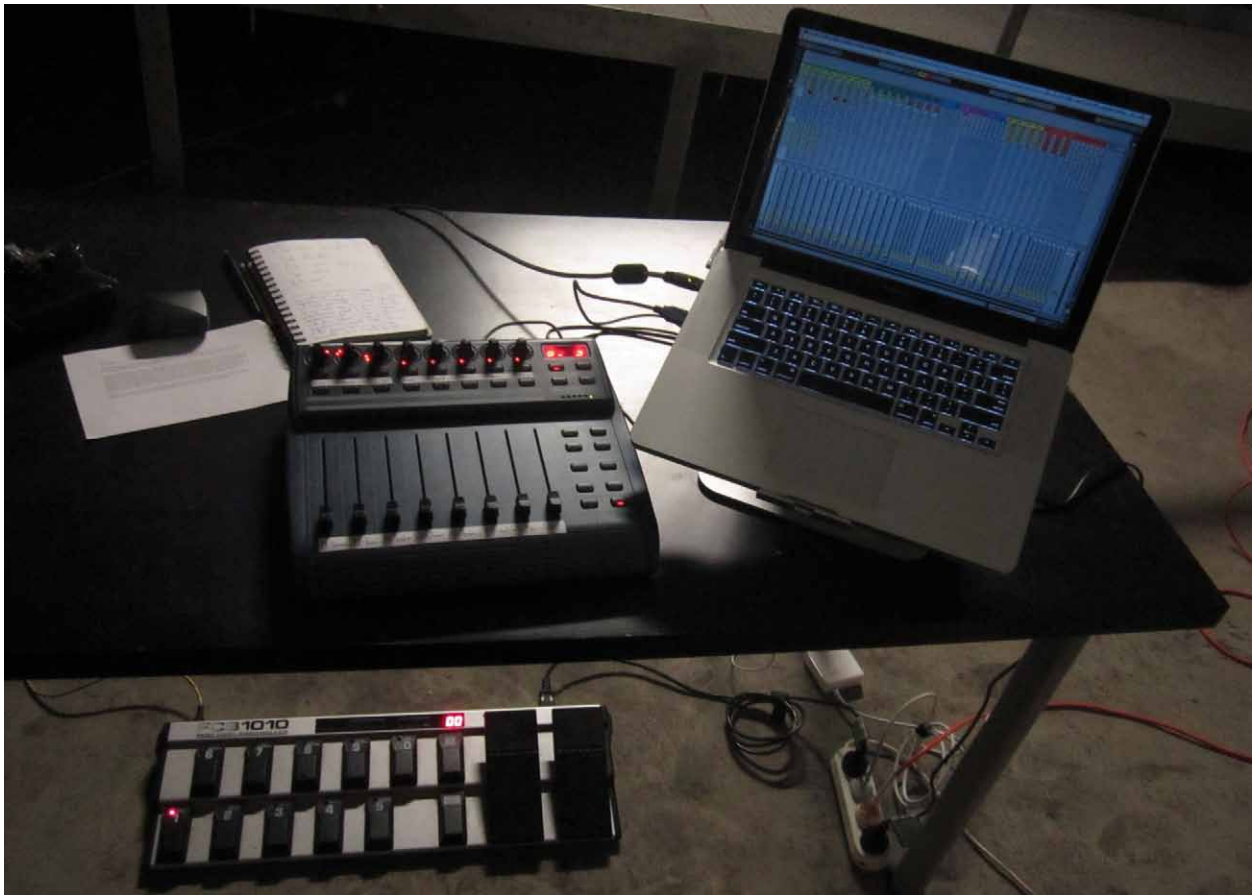


Image 53: The performance setup

I used a Mac laptop running Ableton Live, a Behringer FCB1010 midi foot controller situated beneath the table, and a Behringer BCF2000 midi hand controller situated to the left of the computer from which I controlled volume, triggering and other effects.

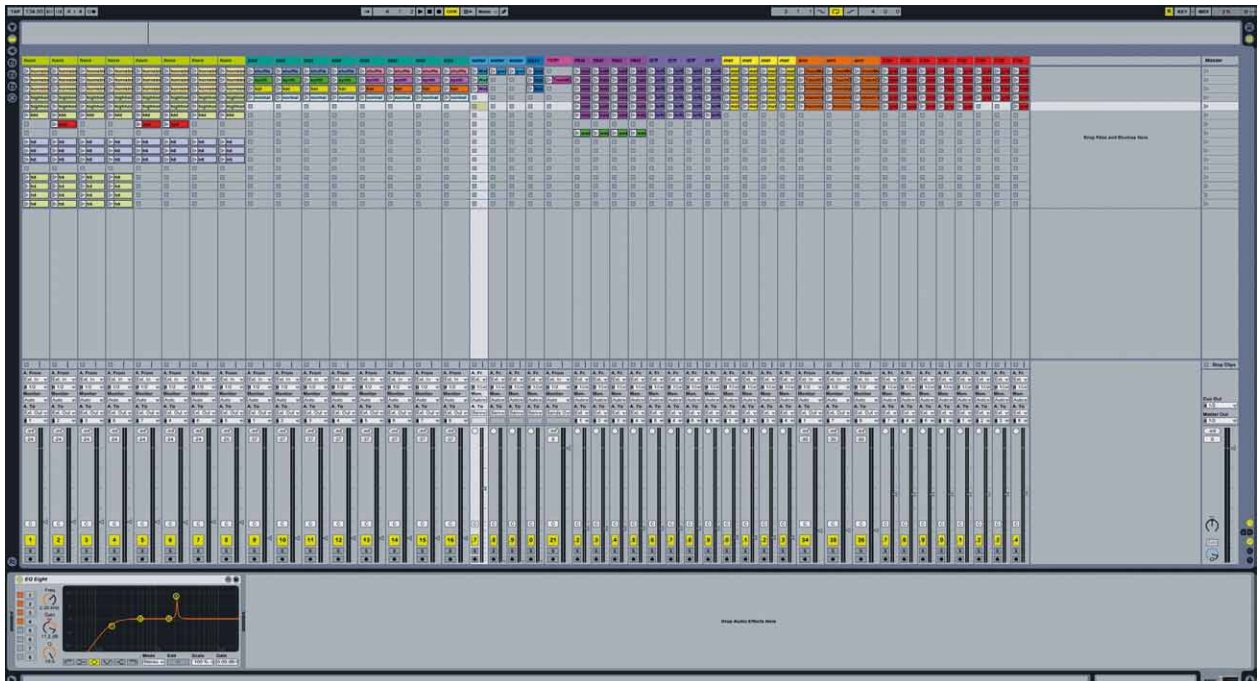


Image 54: the Ableton Live session

44 tracks were loaded with sounds edited from sound recordings in the Trench. From left to right (colour coded), there are four and eight channel spatialised train horns, ambient stationary trains, water, buzzes, four channel spatialised passing trains, PA recorded melodies, PA announcements and a variety of eight channel spatialised sounds including train hisses and electronic treatments. The EQ Eight VST in the bottom left of the image marks the early stages of playing with the resonant frequencies of The Trench.

reached my ears I would respond by releasing their synthesised equivalents into the environment, thus transforming the Trench's affective ecology into altered experiences of the familiar. The second spatial sound design recording session, completed the day before the performance, has been added in full as Appendix 5. These sessions were very important, as they not only allowed me to prepare for the performance, but also contributed to my own merging with the Trench: I became part of the ecology of the Trench, which was affecting me, just as I was affecting it.

During these sessions I found playing with the train horns to be particularly interesting. I used the pitch-shifting and stretch functions in Metasynth, and then using WasP I rendered multiple audio files of train horns to be panned across four or eight speakers. Audio Samples 26-29 are fragments from these sessions, and in their quality demonstrate a marked improvement in the technique of blending real and synthesised sounds that was developed during the *Revoicing the Striated Sound(scape)* project; in the *Revoicing* recordings, it was still possible to distinguish between real and installed air-conditioners (although the change in site was largely responsible for this). Audio Samples 26-29 were recorded on a pair of Rode NT5s pointing to either end of the Trench. Audio Sample 26 is an example of the electrical buzz and its edited equivalent, Audio Sample 27 is the transformation of water sounds using granular synthesis techniques and Audio Sample 28 is a train sequence, in which the ear's inability to distinguish a real train and a virtual train is apparent.

A highlight during the live spatial sound design sessions was an impromptu improvisation session with a train driver, which can be heard in Audio Sample 29. I noted that train drivers only ever use their train horn a maximum of two times, however on this occasion the train driver blasted his train horn three times, and I was able to respond each time. It was an exhilarating moment – not just because of the loudness of the train horn, but because I was directly intervening in the social ordering of the everyday: a moment in which the linear repetitive rhythms of the *isorhythmic refrain* had been momentarily perturbed by a creative disturbance.

Audio Sample 26: Buzz design (27s)

A periodic electrical buzz would occur in the space. I recorded it and edited its sound to give it a subtle shift in texture. This file is quiet, which is a true representation of the softer sonic moments offered by the Trench.

Audio Sample 27: Water design (40s)

Liquid would gush through the pipes from one end of the Trench to the other. I used granular synthesis to give the water alternative textures. In the background are the real and synthesised hum of a stationary train.

Audio Sample 28: Train sequence (42s)

This is a mixture of a real and synthesised train, as well as real and synthesised hisses. They are difficult to tell apart. Also heard in this file are some of the more heavily synthesised electroacoustic sounds I was exploring for the performance.

Audio Sample 29: Train driver jam (1m 56s)

A train driver responds to my sounds with three horn blasts. Other introduced sounds include reworkings of a PA announcement, PA introduction signal and pre-recorded PA voice.

Originally, the live spatial sound design sessions were only meant to be 10-minute recordings, but I got so inside the experience that an hour went by rapidly. It was a meditative experience that undoubtedly brought me closer to the Trench, and added to the quality of the performances, as I had spent so much time listening and playing with the space. I felt like a link in the communication between the sounds of the Trench and their edited equivalents, which resided inside my laptop. As a meditative experience (perhaps an equivalent of Pauline Oliveros' deep listening experience¹⁰²), I let go of any sense of ownership over the synthesised sounds and was guided by the sounds of the Trench itself. This experience was the inspiration for a paper I wrote for the *Buildings Journal*, titled "Site-Specific Soundscape Design for the Creation of Sonic Architectures and the Emergent Voices of Buildings" (Lacey, 2014). In the paper I suggest that the *Voices* of buildings can be realised through spatial sound design: because the experience for me was exactly this, as if a pantheistic quality was being evoked – the *Voice* of the Trench – that informed my performative responses.

Performing Subterranean Voices

Each performance lasted for 20 min, with six consecutive performances over two consecutive days, on Saturday the 31st of August and Sunday the 1st of September, 2013, between 1-4 pm.¹⁰³ Approximately 10-20 audience members per performance were permitted into the site. They were accompanied into the lift by a volunteer, and then encouraged to take one of the seats that I had distributed throughout the site based on what I thought were the ideal listening positions (see Image 55). As audience members entered the space, they heard the transformed hum of stationary trains, and once the audience was seated I proceeded to perform the composition.

From Live Spatial Sound Design to Composition

The reason I decided upon a composition rather than an exclusively interactive piece (similar to the live spatial sound design sessions) was due to a startling discovery made a week before the performance: the trains did not run on either of the platforms adjacent to the Trench on Saturdays or Sundays. At first I panicked. I had created a work based entirely on responding to the dramatic shifts in dynamics afforded by the Trench's weekday sonic ecology, but of course I now realised that I would be interacting with a much quieter sonic ecology. This was not problematic in itself, as interacting with the quiet aspects of the space was intriguing. The problem was that I had designed much of the edited sound to respond specifically to the loud, mid-week, site-specific sounds. Due to the time constraints, I had insufficiently deployed one of my own conceptual tools for urban sound(scape) design. A more thorough application of *The Isorhythmic Refrain* conceptual tool would have enabled me to deduce this reality earlier. The Trench was captured by repetitive refrains, in particular the relationship of train timetabling and the organisation of the social – but not on the weekends! I had to reconceive my approach to the

¹⁰² Pauline Oliveros' sound works elicit a meditative response in the listener. She has written a book titled *Deep Listening: A Composers' Sound Practice* in which instructions are provided to enter a deep listening state. I didn't follow these instructions per se, but her approach has encouraged my own practice of concentrated listening preceding sonic interactions with sonic ecologies.

¹⁰³ For details about the performance as recorded on the Liquid Architecture website please see: <http://www.liquidarchitecture.org.au/subterranean-voices-by-jordan-lacey-performance-two/> (accessed 30/7/14).



Image 55: Audience seating positions

I placed ten chairs around the Trench based on what I thought were the ideal listening positions. Audience members entered via the lift, which can be seen towards the back of the photo. The transformed stationary train hums were playing as people entered. Image © Ellen Dewar.

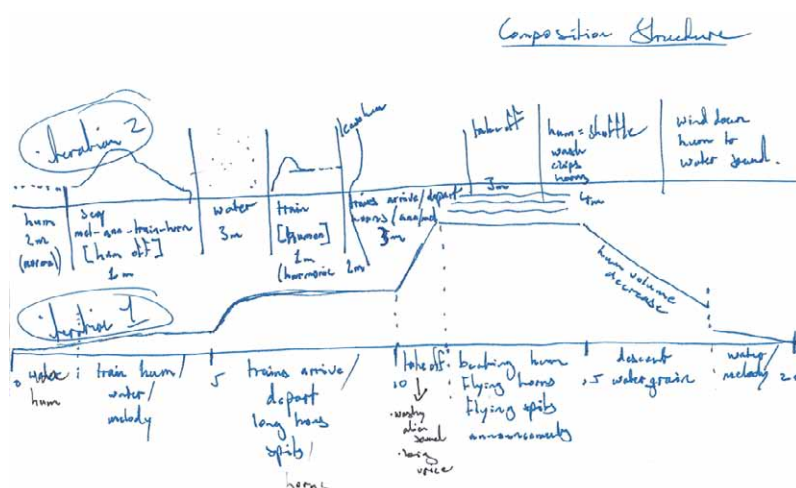


Image 56: Composition structure (notes)

The composition comprised eight parts, including two periods of silence. It began with a hum as the audience was settled, which was followed by a sequence of train sounds, then silence. Then followed a more intensive series of trains, then again silence. After was a build-up to an intensive sonic experience featuring an ascending train, and a dissipation to an extended period of quiet interaction with the Trench, which (at that moment) was reflective of my pre-performance interactions.

performance, and eventually I came to think of the space as a type of vessel, within which I could take the listeners on a journey, just as the trains on either side delivered people from one place to another. The sonic space was suddenly inverted. I would bring the outside sounds to the inside and recreate the week, as an inverted quotidian journey (six journeys a day, in fact): a weekend ride for the imaginary commuter.

The Performance

The composition comprised eight parts, as can be seen in Image 56. As the audience entered and took their seats, a train hum was active. Once the audience was settled, a sequence was activated, which featured a PA announcement/melody followed by the sound of an arriving train, finally terminating in silence. A 2-3 minute section followed in which water and buzz sounds interact with the Trench's

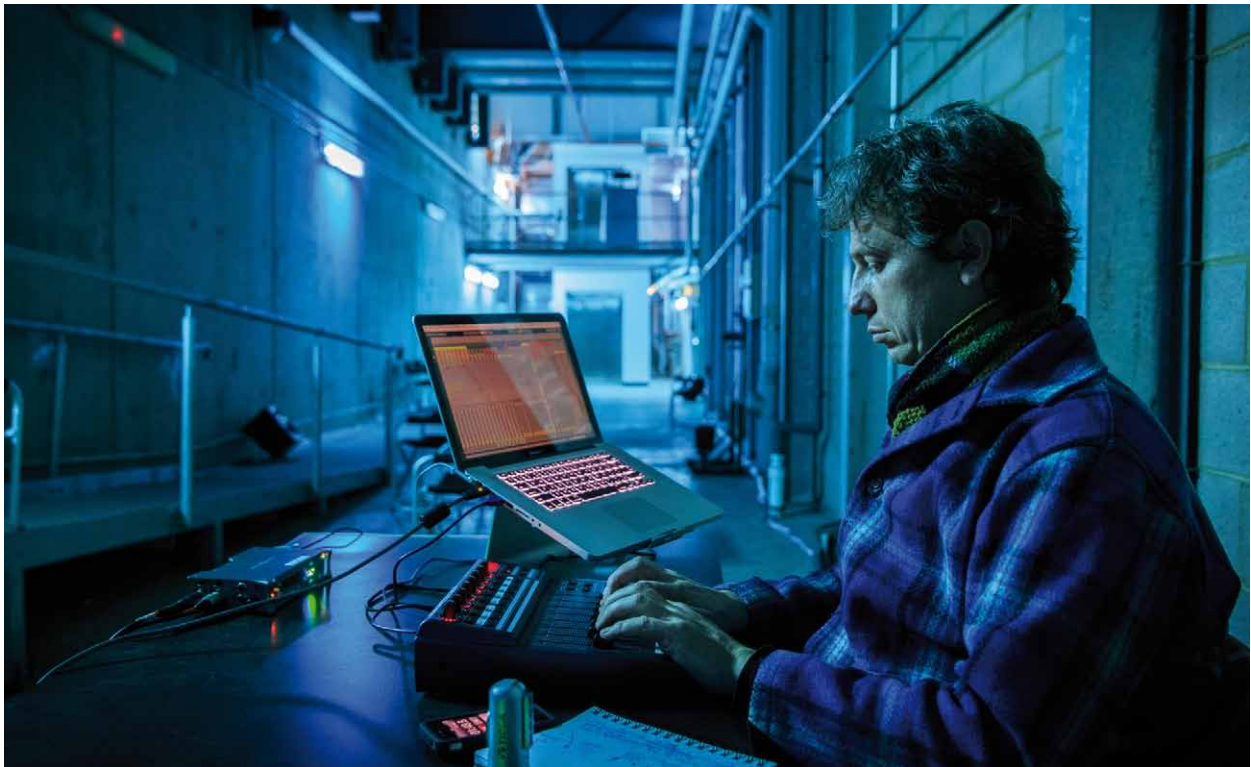


Image 57: Performing in the Trench

The performance was a combination of listening, triggering sounds and following the compositional structure, which can be seen in the notebook at the bottom of the image. By the end of the 12 iterations, I was becoming more adept at connecting with the soft train station sounds towards the end of the composition, which created a dreamy atmosphere for the audience. The blue lighting was caused by blue lighting gel I had placed over the fluorescent lights. I chose blue (including my jacket!) as the whole space had a cold and steely presence, which I wanted to emphasise. Image © Ellen Dewar.

sound(scape); the section transformed into an extended train sequence, including spatialised trains and train horns. This ended in silence before the beginning of a dramatic train takeoff sequence in which multiple train sounds were combined, with pitch shifting applied to create a sense of an ascending train (as related to the idea of the audience being situated in a transportation vessel). This was followed by an active phase of spatialised electronic sounds, train hisses and train horns, which reduced in volume until the final section, which was a subtle play between real and synthesised sounds. Audio Samples 30-36 present fragments of the performance in the same order as described in the preceding sentences, and the composition structure shown in Image 56. Due to the significant variations between loud and quiet moments in the performance, the volume levels of the Audio Samples have been adjusted to ensure that the quieter moments are clearly heard; however, I have attempted to maintain their relative volume levels, as much as possible, so as to approximate the original listening experience. Appendix 6 is a full, unedited recording of one of the live performances, which the following samples have been drawn from. Image 57 is a photo of me performing *Subterranean Voices* (before the audience had entered).

Audio Sample 30: Train hum as audience settles (32s)

Note the squeaking sound of chairs. The train hum is synthesised; there is no real train hum operative. This was one of the consequences of performing on a day when no trains were present – I had to create a sense of the presence of trains.

Audio Sample 31: Initial train sequence (44s)

The initial train sequence is a PA melody, PA announcement, a spatialised train approaching, and a spatialised train horn. A “hole” in the train horn is noticeable here. Unfortunately, at this point two channels of an amplifier, due to an internal fault, produced vastly reduced volumes, causing a noticeable gap in spatialised sound paths.

Audio Sample 32: Silence to altered buzz and water (1m 08s)

Silence became the most evocative feature of the performance, particularly in relation to louder sounds such as Audio Sample 34 and as transition points between performative moments. The synthesised sounds of buzzes and water flows are slowly introduced towards the end of this sample.

Audio Sample 33: Extended train sequence (32s)

Trains arrive from multiple directions, and surreal melody sounds and long train horns build towards the crescendo as heard in Audio Sample 34. The clicking sound is the automated function of my Behringer hand controller, the faders resetting as I move between grouped tracks in Ableton Live.

Audio Sample 34: Train takeoff (1m 02s)

An edited segment of the crescendo. This is the sound of a single train approaching the platform, which has been looped in Metasynth and pitch-shifted so that the intensity slowly rises. The Trench is treated as a transportation vessel, which is now taking off for its “imaginary” weekend commute. The 39s mark is the point of arrival.

Audio Sample 35: Electronic and spatial play (28s)

After the takeoff, there is an extended section of electronic sounds (suggestive of a surreal “other” place) and spatialised train hisses and train horns. Note the rapid introduction of sounds and their dramatic spatialisation.

Audio Sample 36: Quiet merging of real and synthesised sounds (38s)

After 12 performances, this was always the section I enjoyed the most. After the intensity of the train takeoff it was an opportunity for the listener (including me) to enter a meditative state, immersed between a world of real and synthesised sounds. Indeed, most audiences would linger after the end of the composition, engaged in a deep listening to the real sounds of the Trench. Note the crossing signals, passing trains, and at 22s, the distant tone: the real and synthesised disappear and are replaced by a transformed sonic ecology.

Project Findings

After each performance of *Subterranean Voices*, I observed that the audience would sink into a long meditative silence that lasted well after the performance had ended (I asked the Liquid Architecture volunteers to allow the audience to linger as long as they wished). I believe this was due to the application of *Repatterning the Urban Sound(scape)*, which affords an ambiguous mixture of real and synthesised sound, ensuring perception – when attempting to locate the source of reality – is suspended in a constant state of unknowing. To me, this is analogous to a dreamlike state in which the real and the imaginary combine. A practical compositional decision aided this process. Each performance included a powerful climax of synthesised train sounds that enveloped the audience, followed by a rapid transformation into dramatically reduced dynamics, and interwoven real/synthesised sounds. The acoustic horizon instantly spread outwards, such that the spatial difference of near and far (as well as the perceptible difference between real and imaginary) collapses into a single amorphous listening space. As the composer and performer of the piece, it is interesting to note that as exciting as it was to perform the climax, after approximately eight performances, this moment became more process-oriented than a passionately delivered and exuberant gesture. However, the act of weaving quiet, synthesised sounds with the distant sounds of Finders Street Station was endlessly fascinating, peaceful and evocative – forming an almost trance-like experience. This moment of the composition was closer to the experience of the live spatial sound design sessions, and I think points the way toward permanently placed installations that produce transformative atmospheres within urban spaces on an on-going basis. I believe that in these moments, I was sharing a similar listening state to the audience. Most fascinating is that the listeners (and I include myself as performer here) maintained this listening state for several minutes after the synthesised sounds had been removed. The affective atmosphere lingered well after the sound effects had ceased. There are some interesting connections to be made here with *Silencing Urban Exhalations*. Subtraction re-emerges in *Subterranean Voices* as an important approach to transforming sonic ecologies. Except, in this case, it is the rapid change from loudness to quietness, and then the complete absence of synthesised sounds (rather than real sounds, as occurred in *Silencing Urban Exhalations*) that created such a profound impact. I think that this is the most poignant moment of the performance, when all introduced sounds are subtracted and the audience is left with a heightened perception in relation to the existent sonic ecology.

Audience reaction to the work was very positive. Typical feedback was that the experience was relaxing, including an oft-heard reflection that urban sounds, typically defined as noisy, in this instance were able to create relaxing, even meditative experiences. Some listeners also appreciated the fantastical and mythological nature of the work, which afforded imaginative experiences to them; Michael Shirrefs – a Features Producer at Radio National who interviewed me in the Trench,¹⁰⁴ – upon hearing a recording of the work, stated: “It’s simply wonderful! It’s a steam punk fantasy [...] so filmic and other-worldly [...] and very musical” (email correspondence, 03/09/2013). Shirref’s comments reminded me of Thoreau’s reflections on the cry of locomotives through the woodlands: a mythic countenance emerges.

104 As part of a feature on Radio National's Into the Music, titled *Acoustic Architecture*. To hear this feature, please visit <http://www.abc.net.au/radionational/programs/intothemusic/acoustic-architecture/4969332> (accessed 04/08/2014). It includes interviews with Richard Toop and Lawrence Harvey.

Upon reflection, I believe what I discovered in the Trench was a dreamlike atmosphere through the method of *Repatterning the Urban Sound(scape)*, which combined the real and the synthesised. It is the sense of ambiguity that emerges within the listener, in contemplating the reality of the present moment, which results in the emergence of a dreamlike atmosphere; it is this atmosphere out of which meditative listening states emerge. I have potentially discovered yet another variety of site-of-respite, in which urban noise is transformed to affect meditative listening experiences, rather than removed.

Project Research Outcomes: *Subterranean Voices*

Subterranean Voices provided me with the opportunity to test the third conceptual tool, *Repatterning the Urban Sound(scape)*. While immersed in the sonic ecology of the Trench, I produce live spatial sound designs and 12 iterations of a composition created for the Trench. In both cases, I discover that the mixture of real and synthesised sounds transformed the Trench's sonic ecology to affect imaginative, and *meditative* or dreamlike states, suggesting potential design responses to urban sounds for the emergence of transformative listening spaces.

5.2 Project 6: *Noise Meditations*

Project Synopsis: *Noise Meditations*

Noise Meditations was part of *Place*, a collection of site-specific inspired works curated by Philip Samartzis for the "Now Hear This" sound exhibition, part of Melbourne Now at the National Gallery of Victoria, running from 22/11/13-23/03/14. The work was approximately 10 minutes in duration, and composed of synthesised sounds from the projects *Revoicing the Striated Sound(scape)* and *Subterranean Voices*.

Noise Meditations was part of *Place*, a collection of site-specific inspired works curated by Philip Samartzis for the "Now Hear This" sound exhibition, itself part of Melbourne Now at the National Gallery of Victoria, which ran from November 2013 to March 2014. The work was composed specifically for headphones, and was initially designed to emphasise the ubiquity and homogeneity of low-frequency sounds that transverse urban spaces, particularly the striated sound(scape) which is evident in the sonics of air-conditioners and stationary trains.

The name *Noise Meditations* came to me during its composition. I was simultaneously reflecting on my experiences in the Trench and the various comments I had received (in conversation, overheard, or relayed) from audience members, which ranged from expressions of relaxation, to surprise that urban sounds could create a meditative effect. It is the meditative potential inherent in urban noise that enabled me to discover the elusive site-of-respite for which I searched during the *Sites-of-Respite* project. There is, of course, an important difference between *Revoicing the Striated Sound(scape)* and *Subterranean Voices*. The silent weekend schedule at the Trench contributed significantly to the audience's meditative listening

experiences. But even in the laneway, I propose that the imaginative, even unnerving, experiences of the air-conditioners produced a site-of-respite, not necessarily from the volume of urban noise, but certainly from the everyday banalities and sonic homogeneity of urban noise. While only a minor work in the PhD, *Noise Meditations* is important as the reworking of synthesised sounds from *Revoicing the Striated Sound(scape)* and *Subterranean Voices*, and because it allowed me to engage with the sounds without having to be concerned with the pressures of realising the works in a public space. Thus, I was able to engage with the sounds in a more relaxed and playful manner. This process was critical for me in discovering the title of the work, which simultaneously came to define a conclusive point in my PhD project work: project work that had begun with the intent to remove urban noise was ending with the discovery of the meditative potential inherent in urban sounds.

Project Research Outcomes: *Noise Meditations*

The name *Noise Meditations* came to me during its composition. It is the meditative power inherent in urban noise that enables me to discover the elusive site-of-respite for which I was searching during the *Sites-of-Respite* project. I discover that it is possible to locate a site-of-respite where noise is situated, by actualising the meditative potential of urban noise.

6 Rupture: designing urban sonic ecologies

6.1 From Narrative Arc to Ecological Model

The narrative arc of the project works (presented in Chapters 1 – 5) now concludes, and the unfolding story is reinterpreted, through reflective analysis. By reflecting on the totality of the works, it is revealed that *the production of ruptures through a process-of-musicality*, is common to all the projects and conceptual tools. From this discovery the Ecological Model for Urban Sound(scape) Design emerges, which is central to the contribution to knowledge offered by this PhD.

As discussed in the introduction, design research is recursive, an iterative making process that produces new knowledge; accordingly, the ecological model could not have been created without the preceding project work, conceptual tools and post-project reflective process. Chapter 6 marks the point at which descriptions of the making process ends, and an intensive reflective process begins, during which the knowledge produced by the PhD is revealed. As Chapters 6 and 7 are primarily theoretical discussions, they are written with a dense voice more akin to the language used to describe the conceptual tools.

The terms ‘rupture’ and ‘musicality’ are discussed in detail in sections 6.2 and 6.3; an understanding of these terms is critical for apprehending the Ecological Model for Urban Sound(scape) Design, introduced in section 6.4. Before these terms are discussed, two significant post project reflections that preceded the emergence of the ecological model, are presented.

Revealing the Design Approaches

As discussed, the ADR experiences a shift away from the discussion of the unfolding narrative of project realisations and towards a discussion of the Ecological Model for Urban Sound(scape) Design. The four thematic emergences that form the chapter headings 2 – 5, ‘Subtraction’, ‘Addition’, ‘Passion’ and ‘Transformation’, which were initially discovered in a reflective ‘conversation’ with Figure 2, are recognised as ‘approaches’ to sound(scape) design. An examination of Figure 3, see page 98 will reveal that the four approaches form the four outer corners of the model; as such, Figure 3: An Ecological Model for Urban Sound(scape) Design has emerged from Figure 2: Narrative Arc of Project and Conceptual Tool Completions. Figure 2 has been reprinted adjacent to Figure 3, to assist in revealing this

relationship. Note that the four approaches emerge from each of the major projects depicted in both Figure 2 and Figure 3.

Revealing the Ecological Theme

Ecology, from the outset of the PhD, has been of primary interest throughout this making process. That an ecological model should emerge as the contribution to knowledge is a consequence of this on-going research. I have pursued the concept of ecology, and in particular sonic ecology, in conferences, papers, presentations and studio teaching throughout the PhD process. For example, the papers listed in Figure 1 on page 10 include two conference papers presented in mid-2013: 'Urban Soundscape Installations for the Diversification of Acoustic Ecologies: an Ecosophical Approach' (Lacey, 2013), which has been submitted for publication in the *Filigraine Review*; and 'Designing Urban Soundscapes for the Effects of Nature', published as a book chapter (Lacey, 2013). Prior to this, in mid-2012, I published a paper in the journal *Soundscape* titled 'Biophilic Soundscape Design in the Second Order of Nature' (Lacey, 2012), which began my public discourse on ecology. Finally, a paper slated for publication in late 2014 in the journal *Sound Effect: An Interdisciplinary Journal of Sound and Sound Experience* titled 'Conceptual Overlays for Urban Soundscape Design Emerging from a Transversal Analysis of Lefebvre, Deleuze and Guattari, and Arendt' (Lacey, 2014) includes two of the conceptual tools discussed in the present ADR, but also includes a detailed comparative description of ecological concepts that traverse the writings of Felix Guattari and Henri Lefebvre, whose theories will be referred to at length in this chapter. These four publications represent an on-going interest in the question of ecology as concept, particularly in its relationship to sound(scape) design. In addition, in late-2011 and early-2012 I taught two iterations of *Soundscape Studies* at SIAL Sound Studios, in which I explored the concept of sound-as-ecology as being the interface between the built environment and listeners. This culminated in the creation of an Interior Design specialisation (2014) titled *Urban Sound Laboratory*, which explores, along with 3rd and 4th year Interior Design students, the design of public listening points that can be managed as on-going sites for the realisation of sound-art installations. Finally, I was invited in mid-2014 to participate in a workshop held by the RMIT Design Research Institute titled *Designing Atmospheres*, in which I, and a number of design colleagues from the school of Architecture and Design, alongside a number of sociologists, discussed affect and atmosphere; the content of these discussions resonated strongly with my own ecological considerations. These various theoretical studies and explorations, in connection with the unfolding project work, have synthesised into an urban sound(scape) design imperative that informs my practice: the identification of homogenous ecologies and their diversification through the production of ruptures.

6.2 Towards Rupture

Affective Sonic Ecologies

Of all the 'ecological' theorists I have encountered, Timothy Morton has had the most profound impact on my research. Morton provides a compelling argument that Romanticism produced a disconnection between real ecologies and an illusory nature. He suggests that "in

a society that fully acknowledged that we were always already involved in our world, there would be no need to point it [Nature] out” (Morton, 2007, p.141). He argues that ecology does not need nature – nature is in the non-existent “out there”, while ecology is in the *here and now*. Morton describes ecology using the analogy of a Mesh, which is “the interconnectedness of all living and non-living things” (Morton, 2010, p.28), including all the things we would rather not consider, such as the rubbish, stench and noises present in Rainbow Alley. In answering Morton’s criticisms of the romanticising of “nature”, when discussing the urban sound(scape), I refer to *affective sonic ecologies* rather than *acoustic ecologies*. While this may seem only a minor variation, I see the difference as a significant iteration that eschews the romanticism implicit in the concept of acoustic ecology. The term acoustic ecology is vague: ‘acoustic’ seems to relate to the need for some type of scientific legitimacy,¹⁰⁵ and ‘ecology’ is presumably an interchangeable word for nature, when considering the emphasis the WSP and the WFAE place on the importance and superiority of natural soundscapes.¹⁰⁶ Sonic, for me, suggests something physical, experiential and immanent rather than the quantitative, and objective implications of the term acoustic.¹⁰⁷ And ecology, rather than a romantic notion that suggests a perfect natural place “out there”, is understood as the interconnections between living and non-living things in the here and now. In my understanding, no sonic ecology is considered to be of greater value than any other sonic ecology; rather the significant difference between affective urban ecologies is that although *all* ecologies are affective, some are more diverse in their affects than others. For example, the laneway in which *Revoicing the Striated Sound(scape)* was realised typically affords limited affect, such as the withdrawn and disinterested listener. However, the realisation of the work in the laneway produced a range of human responses and artistic development that was a direct consequence of encountering the altered sound(scape)s. Another example is provided by the work *Intimate Footsteps*. The austere environment of the lower levels of RMIT’s Design Hub, the location of *Intimate Footsteps*, typically encourages rapid transitions from one space to another; however, the presence of the “Passion Machine” produced affects from which emerged joyful expressions, and unexpected mergings of real and synthesised sounds.

Captive Atmospheres

From Gernot Böhme’s statement that acoustic atmospheres exist in the “in-between” that are “object-like emotions actualised by discerning subjects” (Böhme, 2000, p.15) to Jean-Paul Thibaud’s recent discussion of his “focus on the overall salience of ambient sound [...] to better understand how it infuses and pervades everyday urban experience”¹⁰⁸ (Thibaud, 2014), atmospheres are of increasing interest in contextualising sound, affect, experience and the everyday. Within my own practice I understand atmospheres to exist *within* ecologies. If an atmosphere is understood as the spaces that exist in between objects and/or subjects, it may be argued that atmospheres are the locus of the dynamic of relations that forms the interconnections between living and non-living things. As such, the Mesh, as described by Morton, is understood as connections *and* in-between spaces; that is, the in-between spaces of the Mesh contain the atmospheres, without which the interconnections could not form. *Ecologies are the interconnections, and atmospheres are*

105 For example, “Part 3: Analysis” of Schafer’s book *The Soundscape* lays the groundwork for an analytical approach to soundscapes. More recently, Bernie Krause has worked with others to create a scientifically validated domain of study titled *Soundscape Ecology*. For more information on Soundscape Ecology, see Pijanowski et al. (2010).

106 A recent video by Bernie Krause makes this point clear. A comparison between ‘urban’ and ‘natural’, with the singular objective of presenting the urban as bad for our health and the natural as not, is presented. See: <https://www.youtube.com/watch?v=j8TSIC13WR8> (accessed 03/08/2014).

107 Having said this, theorists such as Marshall McLuhan (1960) and Gernot Böhme (2000), who use the terms ‘acoustic space’ and ‘acoustic atmosphere’ respectively, are exploring non-quantitative qualities. However, ‘acoustic’ is more generally a reference to the science of sound.

108 See <http://www.invisibleplaces.org/invisibleplaces.html#k01> (accessed 03/08/2014) for a written record of Thibaud’s abstract for the keynote address delivered at the 2014 *Invisible Places, Sounding Cities* conference.

109 Atmospheres are highly dynamic: for example it only takes a gust of wind to shift a field of sounds or smells.

110 The controls being the discussed spatiotemporal controls in conceptual tools I and IV. To provide a simple example: the dominance of air-conditioning sounds switched on and off at the same time everyday produces predictable everyday sonic patterns in the laneways of the Melbourne CBD.

111 The homogenous pattern being, in this case, the striated sound(scape).

112 I understand existential change to be changes to everyday existence, caused by the emergence of diverse affects.

the medium within which the interconnections form. Understood in this way, atmospheres are the substance of ecologies within which relations emerge, in the here and now. This explains, for example, why the diffusion of sound in a space can instantaneously produce an altered ecology: because the sonic affects immediately produce new relations.

In the section (3.3) discussing conceptual tool III, I argue that sonic ecologies are captured into set patterns. The pattern of sounds, captured in repetitive form, produce homogenising affects, which inform the repetitive and banal experiences of the everyday. But as I have just argued, ecologies consist of atmospheres, and atmospheres are a medium in constant flux;¹⁰⁹ thus, my discussion of set patterns must be contextualised within the atmospheric conditions of flux. To do this I will employ a visual analogy. The captive pattern may be conceptualised as a field of sounds that shimmers within and around a homeostatic position: like a kaleidoscope placed against the eye that is gently shaken (not rotated) from side to side. There is indeed variation in the pattern, but the variation is contained within a central motif of control¹¹⁰. Challenging the homogeneity of urban sonic ecologies provides an imperative for the designs discussed in the project work, where the existing atmospheres of urban ecologies are repatterned for the production of diverse affects; or to extend the previous analogy, the chamber of the kaleidoscope is rotated, which produces continuous repatternings. For example, the site of *Silencing Urban Exhalations* produced a sonic ecology of diminished complexity in which a dominant homogenous pattern¹¹¹ recurred on an everyday basis. However, upon the removal of the noise source, the atmosphere was continuously repopulated by new sounds in which diverse interconnections could form.

Understanding Rupture

Rupture is the PhD's *raison d'être* for the design of sound installations in public spaces. If the urban is understood as a homogenised affective atmosphere, ruptures are the method through which affective sonic ecologies are diversified. In *The Three Ecologies*, Felix Guattari states that: "At the heart of all ecological praxes there is an a-signifying rupture, in which the catalysts of existential change are close at hand, but lack expressive support from the assemblage of enunciation" (Guattari, 2008, p. 30). The ruptures created by the sound installations are a-signifying processes, as the repatterning causes the spatiotemporal controls, which are present as signifiers within the captive sounds of the everyday, to momentarily disperse. The dispersal of spatiotemporal controls is the rupture, within which existential changes¹¹² can emerge. The collective assemblage of enunciation, which is the shared speech and gestures of society, becomes challenged within a rupture, and in that moment, emergent affects may produce new social and imaginative relations within and between those who encounter, and thus participate in, the rupture. Upon the removal of the installation, the atmosphere returns to its original reductive conditions, where the signified spatiotemporal controls, and thus the collective assemblage of enunciation, reset into familiar forms. However, after the removal of a sound installation, the emergent affects, which are produced by the rupture, may remain as an imaginative and/or emotional trace within those who encounter the moment. It is plausible, therefore, that the moment of encounter retains an affective quality, which may continue

to diversify ecologies, through the reimagining of everyday sounds, beyond the encountered rupture.¹¹³

113 CRESSON have a sound effect to explain this very phenomenon. It is referred to as anamnesis, which is “the often involuntary revival of memory caused by listening and the evocative power of sounds” (Augoyard and Torgue, 2005, p.21).

6.3 Towards Musicality

Producing ‘Second Nature’

Ruptures can be considered moments of heightened awareness, in which the banal is experienced as unique. I often encounter these moments when visiting State and National Parks in Australia. I listen in the same manner as I do in the city, yet I sense openness within these sonic ecologies that are not present in the urban. The openness is a sonic emptiness, the silence of which *becomes* the ever-expectant emergence of difference. For example, when recently walking in Kaputar National Park in Northern New South Wales, I encountered a long, on-going silence, at one point broken by the shrill cry of a kestrel just above my head – a thrilling moment. On my return journey, a space that was seemingly empty of life, and silent, was now bustling with the excited trills of birds, in their manic preparation for a coming storm. It is my view that such moments of unexpected differences become embedded in the rhythms of spaces in which spatiotemporal controls are absent. Patterns constantly rearrange, disperse and settle – atmospheres and experiences become fluid and unpredictable. Diverse affects *potentiate every moment*, ready to stimulate the imagination, reshape emotional countenance and momentarily recreate the immediate. As a listener, I search for equivalent ruptures in the urban. But they are rarely heard, if ever. In fact, what I heard in the listening journeys of my PhD was the familiar, day after day. The spaces of the urban contain as much potential for rupture as do the non-urban. Yet it is difficult for the ruptures to emerge, due to the ubiquity of spatiotemporal controls, as demonstrated by the power networks that emerged to protect the presence of the exhaust fan outlet, in the project *Silencing Urban Exhalations*.

Henri Lefebvre resolves for me the potential tension inherent in my descriptive experiences of listening across the urban and the non-urban. My descriptions should **not** be read as a preferencing for the ‘natural’ over the ‘urban’ (which should be clear from the previous discussion, *Towards Rupture*); rather, it is a desire to challenge spatiotemporal controls that affect homogenous experiences in space. Lefebvre (1991) calls for the “...immediate production or creation of something other than nature: a second, different or new nature, so to speak. This means the production of space, urban space, both as a product and as a work, in the sense in which art created works” (p.109). By ‘second nature’, Lefebvre means “the city, urban life, and social energetics - considerations ignored by the simplistic nature-centered approaches with their ambiguous concepts such as the ‘environment’” (p.368). Therefore, as I understand it, Lefebvre seeks the creativity and diversity that is common to ‘nature spaces’ to be produced in the everyday life of the urban. This is not an argument for the superiority of ‘nature’; rather, this is an argument for the ubiquitous proliferation of diversity and creativity in *all* spaces inhabited by humans. When Lefebvre calls for the production of a second nature, he is not denigrating the urban, or talking about ‘nature’ at all; rather, he seeks the embedding of socially diverse, creative and meaningful expressions in the everyday. Creating this second nature, in regards

114 I do not equate shamanism with the possession of magical powers, but as the possession of profound listening and musical abilities from which shifts in consciousness, within themselves and/or their listeners, may evoke imaginative mental states.

115 I do not want to enter into a discussion of the definition of music, which is a conversation too broad for this study. However, I would consider 'music', generally speaking, to be understood as the organisation of sound according to a system (pre-existing or self-created). The process-of-musicality described here requires an interrelationship between sound-maker and affective atmosphere, in which any 'musical system' must be considered subservient to the unpredictable emergences of atmospheric flux. For example, the compositions of *Revoicing the Striated Sound(scape)* were created using programs, such as *Metasynth*, that are based upon certain musical systems; however, once the compositions were introduced into the laneway sound(scape), their content and affects upon the environment, were shaped by the unfolding sonic conditions of that environment. When the compositions are played in a controlled environment, such as a concert hall (as they have been), the musical systems from which they were generated are clearly articulated.

to my practice, is the equivalent of diversifying affective urban sonic ecologies. Ruptures, by challenging spatiotemporal controls that affect homogenous everyday experiences, diversifies urban life.

The Process of Musicality

Early in the PhD process, I came across a fascinating paper written by the improvisational musician Tim Hodgkinson called 'Siberian shamanism and improvised music' which was published by *Contemporary Music Review* in 1996. The paper had a profound impact on my sense of music, and consequently, contributed to my practice of producing ruptures through a process-of-musicality. Hodgkinson explains his efforts to create a musical performance that was shamanic – qua transformative – in its effect on the audience. He was unable to achieve this, so he set about learning the musical practice, in-situ, of East Siberian shamans¹¹⁴. This is what he discovered: "(The Western mind) could never have acknowledged the wind, the birds, and the waterfalls; they simply do not elect to perform in a recognised musical key or rhythm. Yet in [...] such natural sounds and their acoustic and temporal relationships (is the suggestion of) *patterns* which in turn associate themselves with *shifts* in the way in which consciousness gains knowledge" (Hodgkinson, 1996, p. 61, my emphasis). It would appear that Hodgkinson is suggesting that the shamanic musician *hears in patterns*, to which the shaman responds with their own sound-making expressions to *interact with* these patterns for the production of knowledge. The environment to which they listen is not a separate entity (a soundscape); rather, it is a merging between listener-musician and sonic ecology by which different states of consciousness are revealed. In keeping with my claim that no sonic ecology is considered better than another, is it not possible that Hodgkinson's shamanic shifts in consciousness, generated by the interrelationships of listener-musician and natural spaces, could not also be generated in the interrelationships of listener – sound-maker and noisy urban sound(scape)s? I call this interrelationship *musicality*. It begets a *process* of sensitivity, listening, response and merging; a rearticulation of the ecology of the moment, through absorption of the atmospheric medium, which is re-expressed by the practitioner to produce altered ecologies. It is the process-of-musicality that creates ruptures, which diversifies typically homogenised sonic ecologies into spaces that produce diverse affects. This I consider to be a contributing process, to the production of Lefebvre's second nature.

'Musicality' suggests a sensitivity to music¹¹⁵, or a musical disposition. The sound installations develop as a consequence of the merging of listener (me) and space. Through listening, I form an intimate relationship with rhythms and textures, its particularities and interconnections; this atmosphere affects me such that my own feelings and experiences are entirely informed and shaped by the ecology in which I am immersed. Through listening, I become an expression of the ecology. This interconnection is what I term, the *process-of-musicality*. Similar to Hodgkinson's description of the shamanic musical process, it is the relationships with the environment that produce musical expressions. Engaged in a process-of-musicality, I listen deeply for the *Voice* of the city: I imagine that its spaces sing, but as the ecology is homogenised by spatiotemporal

controls, the city sings a singular and incessant tune. The tune is sung for itself, for its own perpetuation. Still, this does not prevent me from falling deeply inside the experience. For I must hear, and become affected by the *Voice* in order to diversify its singular tune.

Thus, in the first instance, musicality as an act of listening recreates my own perceptions and interrelationships with the sonic ecology in which I am immersed. In the next instance, musicality becomes a process of sound-making that moves outwards to reshape the immersive experience: an interaction between listener, sound-maker and space. What begins with listening ends with repatterning, in order to produce diverse, on-going listening experiences for myself and others. Musicality seeks patterns, which are repatterned by rupture, for the production of diverse affects. The *Voice* is revoiced.

6.4 An Ecological Model for Urban Sound(scape) Design

Towards Rupture and *Towards Musicality* contextualise the terms rupture and musicality, which is essential for understanding the intentions of the Ecological Model for Urban Sound(scape) Design. The model is a direct outgrowth of the project work and conceptual tools discussed in the present document. In Figure 2: Narrative Arc of Project and Conceptual Tool Completions are four emergences titled Subtraction, Addition, Passion (which is implied by the bifurcation) and Transformation. These four emergences are understood as design *approaches* that were realised in the making of the projects. Figure 3 is to be interpreted as an iteration of Figure 2, in which the narrative arc produces the conditions for the emergence of the Ecological Model for Urban Sound(scape) Design. The model, as represented in Figure 3, is composed of three sections: an orange plane, green radiations towards a rupture point, and dark grey radiations emanating from a process-of-musicality.

The Plane of Approaches and Intentions

The orange section represents a plane, formed by four *approaches* to urban sound(scape) design that have been discovered in the PhD: Subtraction, Addition, Passion and Transformation. There could of course be many more approaches to urban sound(scape) design, but these are the particular approaches that have emerged out of the design research carried out for this PhD. The four approaches have been arranged at the four outer corners of an orange plane. Relations between each pair of approaches have been labelled, which correspond to discoveries made in the project work. These include: quantifiable, playfulness, emotional, absences, meditation and dealienation. See Table 3 for a description of each of the relations. These identified relations may be considered the *affectual design intentions* of a sound practitioner, who creates a sound work with the intention of fostering certain affects in urban space. For instance, the intention to create meditative affects connects the Addition and Transformation approaches. The practitioner can use the ADR to produce the intended affect by referencing the design and conceptual tools of the two approaches, which are explored in

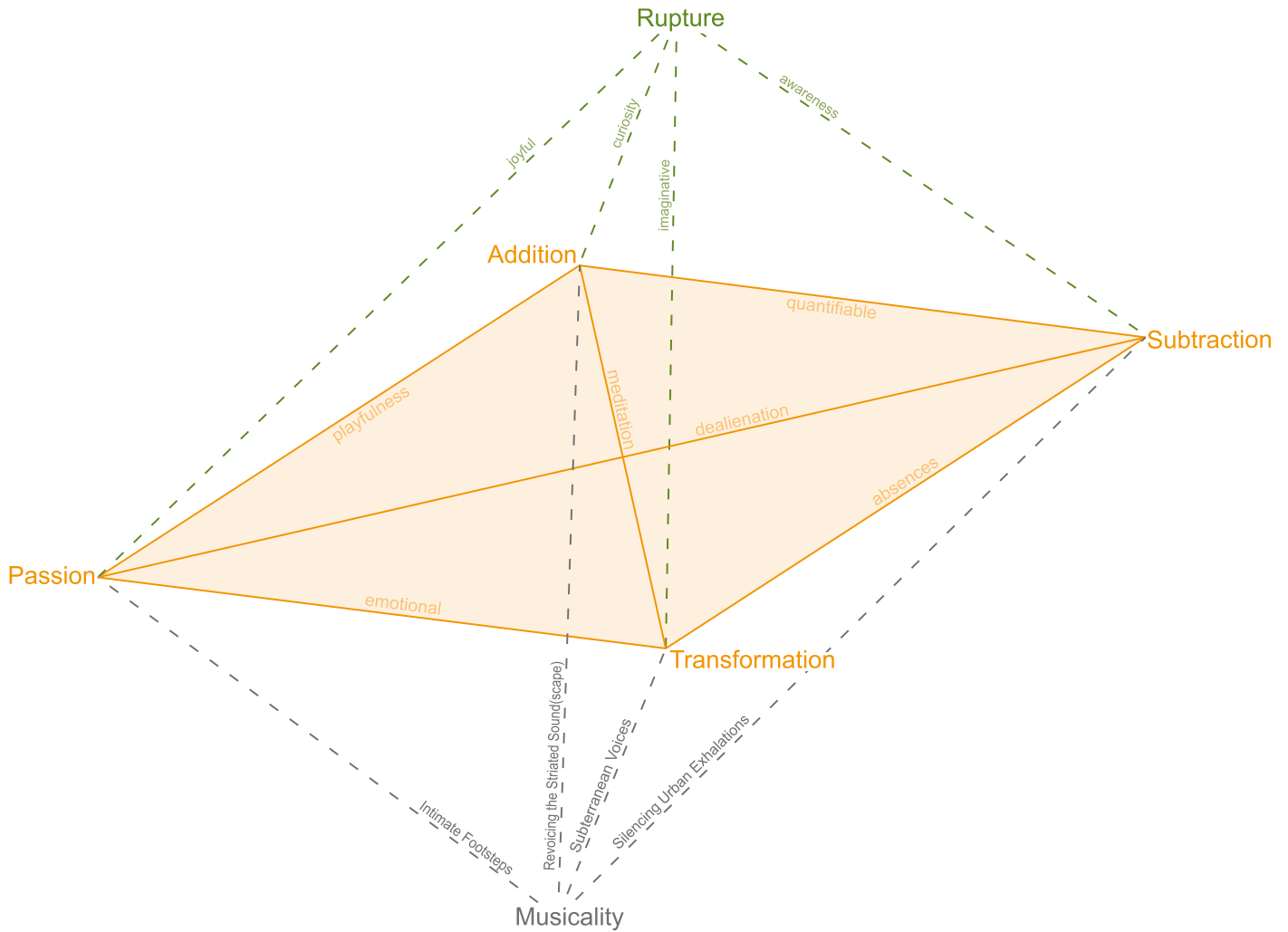


Figure 3: An Ecological Model for Urban Sound(scape) Design

Upon post-project reflection, an Ecological Model for Sound(scape) Design emerges. The orange section represents four *approaches* to sound(scape) design as discovered in the PhD: Subtraction, Addition, Passion and Transformation. Relationships emerge between each of the approaches, which are understood as *affectual design intentions*. In green are the ruptures produced by the differing approaches to sound(scape) design. A rupture is multiplicitous in its affects, and is thus indefinable, however, four experiential rupture types have been identified as emerging from the four approaches: awareness, curiosity, joyful and imaginative. Informing the approaches, in dark grey, are the four major projects, which emerge from a process-of-musicality.

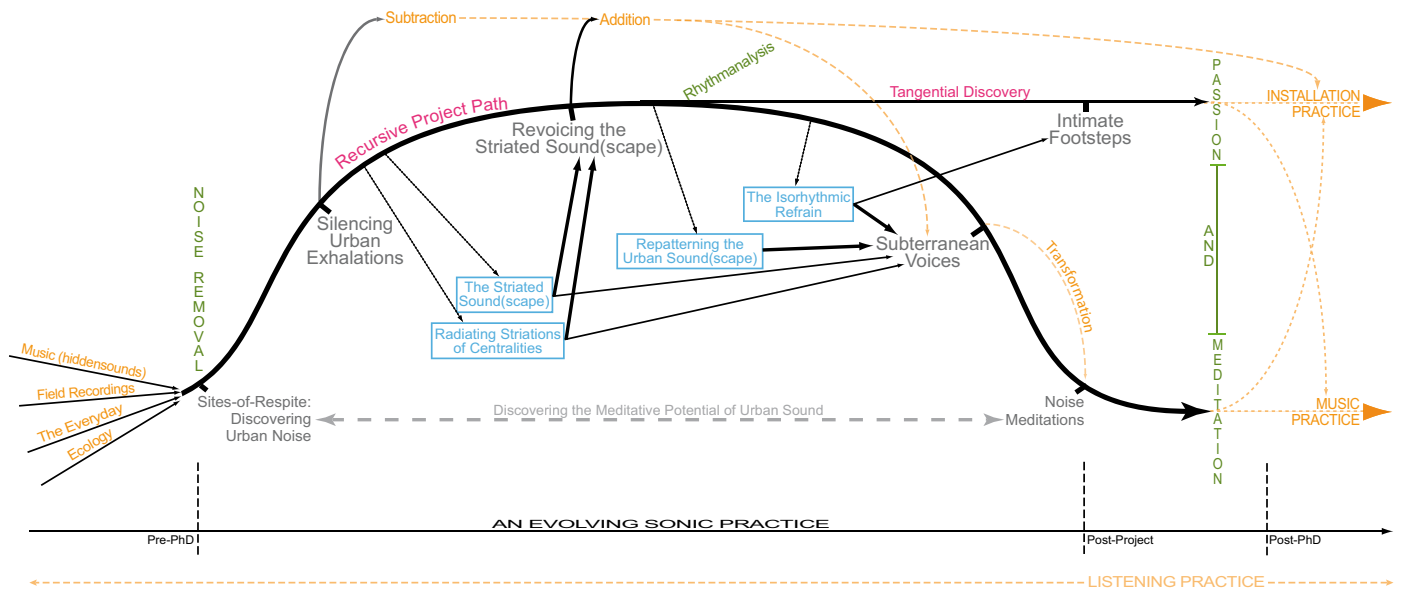


Table 3: Relations emerging from the Ecological Model for Urban Sound(scape) Design

Affectual design intentions [Relations]	Approaches producing the emergent relation		Relation Description
Quantifiable	Subtraction	Addition	Subtraction and Addition require the removal or addition of sound. This is quantifiable in so far as specific sound sources can be identified for removal, and conversely, specific sound sources can be identified for addition. Quantifiable suggests a level of control in regard to the amount of sound involved and the volume levels of sounds.
Playfulness	Addition	Passion	Addition and Passion include a level of playfulness in regard to the mixture of sounds and the experience of users. The addition of sound creates play between real and synthesised sounds. Passion suggests a level of intimacy or privacy in which a sense of personal play emerges.
Emotional	Passion	Transformation	Passion and Transformation involve a level of emotional engagement from the public that is generated by an atmospheric affect of emotionality. Passion creates a sense of intimacy in which personal feelings emerge. Transformation alters the familiar such that neither the original nor the synthesised are apparent: only the emotional affect of subtly transformed realities.
Absences	Transformation	Subtraction	In the Transformation and Subtraction approaches, the familiar becomes absent, and absence creates space for the emergence of the new. Transformation creates absence through the recreation of typically present sounds, and Subtraction creates absence through the removal of typically present sounds.
Meditation	Addition	Transformation	Addition and Transformation approaches that target noisy spaces are able to create meditative affects. In this relation, the approaches merge. The Addition of sounds is also the Transformation of sounds; however, the sounds added should not be able to be distinguished from the original site sounds. Rather a new atmosphere should emerge that is distinct from both the original and the synthesised sounds.
Dealienation	Subtraction	Passion	Subtraction and Passion approaches seek to challenge alienation in public spaces, where alienation is considered the withdrawal of human interconnection into a disconnected individuality. Subtraction removes noisy sound sources that prevent human intercommunication and mask alternative sound sources. Passion reintroduces feelings of intimacy and connection into public space.

Table 3 describes the meaning of the relations that emerge between each pair of approaches in Figure 3. The relations are affectual design intentions that can be applied by the sound practitioner to produce affectual atmospheres in public urban spaces

detail in the appropriately headed sections of the ADR. The design intentions are not fixed, but rather have emerged in this configuration from my own reflective process in the creation of the model, the project work and the ADR – it is plausible that any of the relations could be interchanged, or accumulated, with any other. My research suggests a particular configuration of the plane, as represented by Figure 3, within which I have included the approaches and intentions realised during the course of the PhD research. However, another sound practitioner may well produce an entirely different plane, in shape, content and affect. The plane affords multiple ruptures, the realisations of which are dependent on both the approach and intention of the sound practitioner, and the experiences of those who encounter the sound work.

The Rupture Apex

The green section, *rupture*, is the desired outcome of the creation of urban sound(scape) installations. As mentioned above, Felix Guattari states: “At the heart of all ecological praxes there is an a-signifying rupture...” (Guattari, 2008, p. 30). Rupture is understood as a moment of difference within the homogenised urban sound(scape), which is realised by listeners as diverse experiences. Before a rupture is generated by a public sound work, or correspondingly, realised by a listener, it exists as a virtual rupture within the orange plane represented by Figure 3. As explained by Deleuze, “What we call the virtual is not something that lacks reality but something that is engaged in a process of actualisation following the plane that gives it its particular reality” (Deleuze, 2005, p.31). Virtual ruptures exist within the orange plane (represented in Figure 3), which is a locus of design approaches and intentions that become actualised in the simultaneous moment of a realised affective sound work and its human encounter. Or explained another way, the sound(scape) design approaches give rise to ruptures, which are experienced by, and thus affect, listeners. Ruptures cannot be defined as a specific affect or experience: they are amorphous and indefinable in their potential realisations. However, four rupture types have been suggested in the model, which emerged from anecdotal evidence collected from public responses to the projects produced for the PhD: awareness, curiosity, joy and imaginative. These four rupture types were written in green boldface type in the ‘Project Research Outcomes’ sections at the end of each major project. Each rupture type raises the experience of the subject out of the homogenous field of urban sounds and towards the diverse; thus, by challenging homogeneity, ruptures affirm diversity. The tendency of ruptures to produce unique experiences is essential to the existence of the plane, as the plane is an expression of a practice that seeks to know the urban as a space of diverse encounters: as stated by Deleuze “in the affirmation of the multiple lies the practical joy of the diverse” (Deleuze, 2005, p. 84). Similar to the design intentions in orange, it is reasonable to assume that the green rupture types – awareness, curiosity, joy and imaginative – are interchangeable or accumulative across the represented relations between the approaches and the rupture. The power of a rupture varies in intensity as dependent on the combined consequence of design, human experience and the chance configuration of the spatiotemporal moment.

The Musicality Base

The dark grey section is suggestive of the *musicality* implied by the project work. The four approaches, Subtraction, Addition, Passion (implied by the bifurcation) and Transformation, have become known through a reflective process, in which the unfolding narrative arc of the PhD was realised. As reflected by the structural organisation of the ADR, and also by Figure 3, each of the four major projects have produced a different potential approach to urban sound(scape) design. The projects emanate from a musicality that forms the basis of my practice. The PhD opens with a description of my sonic practice, *hiddensounds*, which is the vehicle through which my creative search for the hidden qualities of sound is realised. Concurrently, musicality is the hidden process within the project work, in which I approach the urban sound(scape) with a musical sensibility. The urban sound(scape), for me as practitioner, is *Voice*: the mythopoetic *Voice* of a heaving Leviathan, which is the vocalisation of the city-in-itself. The *Voice* is rendered homogenous by repetitive patterns (which are explored in detail in conceptual tools III and IV) in relation to the ubiquity of the striated sound(scape) as discussed in conceptual tool II). As such, the city's *Voice* is captured into repetitive forms, as is the experience of the human inhabitants immersed within it. The musicality inherent in the realisation of the projects begins with my self-immersion in the urban, as listener. I merge with the urban sound(scape) and hear its *Voice* – it plays me – and I in turn, play it back. The process-of-musicality entails a mythopoetic relationship between the sonic practitioner and the *Voice* of the city. The practitioner seeks to diversify the *Voice* by producing multiple vocalisations of urban sound(scape)s. Where the *Voice* of the city is diversified, a rupture point is created, which is realised by the listener encountering the rupture as awareness, curiosity, joy, imaginative emergence, or other potential realisations. A pole could be imagined to pass through the centre of Figure 3 directly linking Musicality and Rupture – two ends of the same pole where musicality produces ruptures and ruptures realise musicality. Imagine the upper and lower points of the model pressed into the centre of the orange plane. Rupture and Musicality would meet in the middle, merge as one, and form the centre of the entire practice and the PhD: musicality-as-rupture orbited by a multiplicity of design approaches and intentions, for the diversification of urban sound(scape)s and listener experiences.

7 Contribution to Knowledge

7.1 The Ecological Model for Urban Sound(scape) Design

The Ecological Model for Urban Sound(scape) Design is a contribution to knowledge in the domains of urban soundscape design, site-specific sound-art and sonic theory. The model is presented as a contribution to knowledge from two perspectives: *a meta-diamond of sound(scape) designs* and *the plane of virtual ruptures*.

A Meta-Diamond of Sound(scape) Designs

A diamond is formed at extremely high temperatures, under massive pressure: a long, complex process whose results can be admired even “in the rough”, in the hands of its discoverer. This is how I interpret the shape formed by Figure 3; it is the crystallisation of the PhD work. Until cut into a familiar shape, a diamond is rough and unformed; accordingly, the project work unearthed the diamond, and the post-project work faceted the diamond into the shape seen in Figure 3. Thus far, the diamond counts eight facets, but as the post-PhD process continues, an increasing multiplicity of aspects will construct an ever more elegant structure. The present model may exist simply as a testimonial to the efforts of the PhD, and as such, can be left untouched and enjoyed as a substantial creation born of an intense process of design research; or it could be utilised as a tool, by myself or others, for the creation of sound(scape) designs in public urban spaces.

The diamond shape is named a *meta-diamond*, as it colligates the totality of the PhD work: projects, conceptual tools and processes. In this sense, the entire PhD becomes a contribution to knowledge, as emphasised by the ‘project findings’, ‘project research outcomes’ and the conceptual tools found in chapters 2 – 5, which are all outgrowths of project work. Finally, bringing the base and apex together, where rupture and musicality meet in the centre of the structure, reveals the core of the practice and contribution: musicality-as-rupture. The centre of the structure is also considered to be the position of the listener, who is located at the centre of a field of sounds either real, synthesised, or in mixture; the sound works always privilege the listener, who is located at the centre of experience.

The Plane of Virtual Ruptures

Where the meta-diamond of sound(scape) designs is the totality of the PhD, the *plane of virtual ruptures*, at the centre of the diamond,

is a practical tool intended for use by the creative practitioner. The plane, comprised of relations between the *approaches* and the *affectual design intentions* realised by the PhD, consists of an indefinite number of *virtual ruptures*. As discussed earlier, the virtual “is engaged in a process of actualization following the plane that gives it its particular reality”.¹¹⁷ Understood in this way, the plane, which has been discovered by the ADR’s reflections on the project work, consists of yet-to-be-realised, rupture-producing sound installations. The virtual ruptures specific to the Ecological Model for Sound(scape) Design are actualised by the creation of public sound installations, which have been produced within the bounding conditions of the plane. The practitioner may choose one or more of the affectual design intentions upon the plane and trace this relation back to the approaches between which the relation emerges. For example, if the affectual design intention is meditation, the practitioner can trace this relation to the approaches Addition and Transformation. Each approach, detailed within the eponymous chapters of the ADR, comprises detailed descriptions of project work and conceptual tools, which can aid the intended design process. The project work and conceptual tool descriptions provide practical advice for the creation of sound works in public spaces, as well as precedents by other practitioners that can be explored. The green-coloured rupture types seen in Figure 3 – awareness, curiosity, joy, imaginative – have been labelled according to the affects generated by the four main projects, and suggest an emotionally affirmative quality within the plane; however, yet-to-emerge rupture types may be entirely different, as they are dependent on the manifested affects of the sound work as actualised by listeners. The number of rupture types is indefinite, limited only by the number of actualised virtuals, and their affects, that emerge from the plane. The process-of-musicality, which informs my practice (discussed in detail in section 7.3) and located at the base of Figure 3, potentiates the plane of virtual ruptures.

7.2 The Four Conceptual Tools

The four conceptual tools realised within the PhD and included in the ADR form an interrelated structure, wherein each: produces alternative ways of thinking about and perceiving of urban sound(scape)s; draws in philosophical discussions of significant thinkers into the domain of soundscape design; and, provides a coherent impetus and method for the design of ruptures in urban sound(scape)s. Collectively, the conceptual tools suggest that urban sounds act as signifiers for spatiotemporal controls, which can be challenged with creative design interventions. *Radiating Striations of Centralities* and *The Isorhythmic Refrain* produce a unique synthesis of specific spatial and temporal descriptions by Gilles Deleuze and Felix Guattari, and Henri Lefebvre. Deleuze and Guattari indicate creative relationships with spatial and temporal peripheries, while Lefebvre reveals centralised controls that diffuse throughout the peripheries of space. By combining these creative and controlled aspects of the spatial and the temporal, the tensions inherent in public spaces are revealed, which informs the practitioner’s design responses to the spatiotemporal controls that homogenise urban sonic ecologies. *Repatterning the Urban Sound(scape)* produces an unlikely coherence between soundscape

design discussions by CRESSON and the WSP (or more accurately, Murray Schafer) in which the sound(scape) is understood as a pattern. Urban sounds are captured as set patterns, which become the repetition of the everyday. The repetition of unchanging patterns produces repetitive affects, which inform the banal experiences of the everyday life of city inhabitants. *The Striated Sound(scape)* reinterprets Deleuze and Guattari's discussions of striated and smooth space as a contribution to the analysis of, and creative engagement with, urban soundscapes. In the PhD research, *The Striated Sound(scape)* is the primary empirical example of a repetitive pattern that informs everyday experience. This repetitive pattern is composed of the broadband sounds that emanate from air-conditioners, ventilation outlets and exhaust fans. Reconceiving these broadband sounds of the urban as a mythopoetic entity whose *Voice* has spread throughout the city, rather than characterising them as an exclusively noisy and unhealthy phenomena, provides a catalyst for questioning approaches to urban soundscape design that tend towards negative remonstration. Rather than considering the striations as a negative that must be removed, when heard as *Voice*, the striations enable the reimpacting of smooth space: the realisation of public sound works for the diversification of listening experiences. Further to this, that striated space reimpacts smooth space suggests the striated (broadband sounds) are an affirmation rather than a negative, as it is striated space that *generates the potential* within which ruptures may be realised. This discovery is expressed most dramatically in the PhD's transition, as diagrammed in Figure 2, from a desire to remove noise from the urban sound(scape) towards the discovery of the meditative potential of urban sounds. The four conceptual tools flow into the idea of rupture, discussed in Chapter 6, which becomes the method for dispersing spatiotemporal controls for the emergence of diversely affective sonic ecologies.

118 See: <http://www.theage.com.au/entertainment/art-and-design/many-minds-make-light-work-20120713-22011.html> (accessed 07/07/2014).

7.3 The Process-of-Musicality

During the course of the present research, I have discovered that sound studies touches almost every domain in one way or another. My own contribution to this exponentially growing range of voices is to create an “idiosyncratic poetry”, a term that was used by a Melbourne based journalist to describe my work.¹¹⁸ I understand these terms in the following way: idiosyncratic - peculiar to personal experiences and imaginative play; and, poetry - relationships with space born in the moment, which are given longevity through sound installations and writings. Together, the terms work to produce the image of the subjective listener who brings uniqueness to the moment, which, in relation to my practice, is known as the *process-of-musicality*.

Experiences of the sonic ecology of any space become deeply personal; the entire apparatus of my PhD is built upon this understanding. From this PhD I have realised that it is as possible to be deeply moved by the sounds of a shoreline or the vista of a landscape, as it is to feel deeply interconnected with the neglected spaces of our urban peripheries. Ecologies are everywhere, and each of us is always at the centre of a sonic ecology; listening, absorbing, reshaping and being shaped by the ecology. As an extension of the ecology's atmosphere, I am touching everything and everything is touching me – my very

presence, or absence, reconfigures the ecological interconnections anywhere I am located. This is a profound truth that lies at the heart of the everyday: every perceiving subject is embedded in a relationship with a malleable and dynamic ecology.

To momentarily zoom outwards, the Earth, I think, has demonstrated that a creative evolution of diverse emergences is at the core of its ever-unfolding becomings. The Earth, in its multiplicities, always overcomes reduction, simplification and homogeneity. At the very moment a catastrophe occurs new life colonises the rubble, containing the potential for every becoming that will follow its initial emergence. The creative practitioner, who diversifies the moment, shares this disposition: wherever homogeneity is encountered, diversity is sought. The process-of-musicality perceives of all sonic ecologies as being of equal value, the only critique being that each sonic ecology should express the diversity that is innate to Earthly existence. Understood in this way, the sonic ecology of a laneway filled with rubbish bins, stench and squeaky hinged doorways is no less magnificent than a stretch of coral shimmering beneath the surface of the Great Barrier Reef. It is simply that the diversity of our laneway is unable to be experienced due to the spatiotemporal controls that restrict its potential, and prevent its diverse songs from rupturing the moment. To design sonic ecologies through a process-of-musicality is an act of diversification thorough the realisation of ecological potential; by listening, sound-making, and recreating the moment.

8 Dreaming: the propulsion towards future works

I imagine cities as consisting of networks of rupture points. This dream propels my practice, from which sound installations, born from a process-of-musicality, will continue to be created in public spaces. These rupture points are created to encourage exploration of and interaction with the city, the searching for moments of difference, and these ruptures are intended as the emergence of the profound within the fields of urban banality. Rupture points would provide what, in my opinion, the unfolding spaces of the Earth have always provided – the unexpected, the profound, surprises of unknown quantities and qualities. Modern civilisations may easily dismiss the beliefs of pantheistic societies that perceived the spaces in which they lived to be alive. And surely there is no way, or desire, to return to this experiential state (and all of its hardships). But I imagine that to be responsible for a tract of land inhabited by spirits and fallen ancestors is the equivalent of experiencing the profound on an everyday basis. Accordingly, mythopoetics, as discussed in this PhD, is a desire not to re-enchant space, but to reimagine urban space as something more profound than the banal backdrop of the everyday. Reimagining urban space is not just an act of imaginative transformation by us, it is also the sonic dehomogenising of the urban sound(scape), so that the *Voice* with which we are compelled to communicate on a daily basis snaps us out of our somnambulistic state by forcing upon us the unexpected. A network of sound installations that diversify the *Voice* of the city through the creation of ruptures may be a way toward producing such spatial reimaginings. This need not be subversive, that is, an act that upsets the status quo; surely, an invigorated and creative population will become happier and more productive, which can only serve to benefit the status quo. A network of rupture points does not politically align itself; rather, it would exist to diversify human experiences for the production of joy, wonder and imaginative expression. Rather than spatiotemporal controls suppressing creative emergences, perhaps spatiotemporal controls could serve to encourage the production of ruptures; is it possible that governments could construct policies for the production of profundity? If so, a network of urban ruptures may well contribute to the emergence of such moments. Importantly, a network of ruptures would be born in the *now*, not fixed as ideal impressions of what sounds should or should not be. It is the rupturing of the now, by using the stuff of the now, which affords the emergence of diversity. And that ruptures can be created within the stuff of the now demonstrates that the creative moment can be produced and discovered *anywhere*. Thus, rupturing is an affirmative act that reveals the omnipresence of creative potential; my practice will continue to design for the possible emergences of such momentary profundities.

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